

# THE TANK LOADER'S GUIDE

(TANK, 90-MM GUN, M48A1)

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## INTRODUCTION

**1. Purpose.** This training circular is published as a guide for the individual tank loader and for instructors and supervisors engaged in the training of tank crewmen. When used in conjunction with TC 17-5, The Tank Driver's Guide (Tank 90-mm Gun, M48A1), and TC 17-4, The Tank Gunner's Guide (Tank 90-mm Gun, M48A1), it will be helpful in the planning of armor training programs. In addition, it should be used as a text book by the armor trainee.

**2. Scope.** This training circular covers the skills required of the M48A1 tank loader and is based on the job description of this crew member.

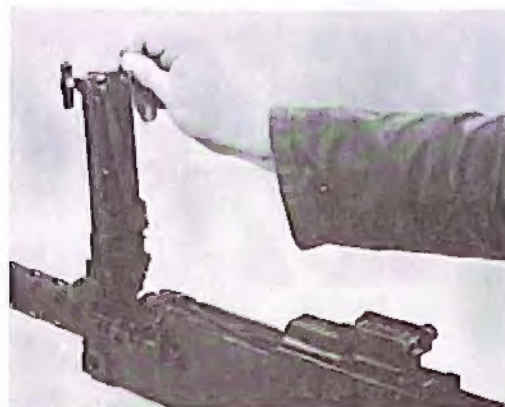


# REMOVING THE COAXIAL MACHINE GUN

- 1** Make sure that the manual safety is pushed to the right (so that the letter S shows).



- 2** (Note: If there is no T block in the receiver of the gun, turn one of the cover latch knobs.) Raise the cover.



- 3** Pull the retracting bar back as far as it will go; holding it back, lock it by pushing the lock button to the right.



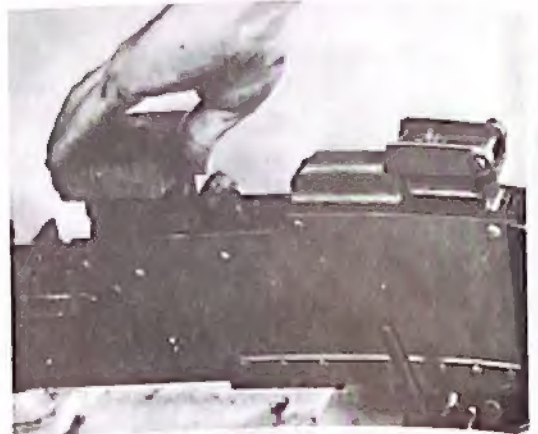
- 4** (Note: If there is a T block in the receiver, take it out.) Feel with one finger to make sure that there is no round in the chamber. (CAUTION: If there is a round in the chamber, do not continue removing the gun until the round has been taken out.)



**5** Lift up the extractor.



**6** Insert a T block into the receiver so that it holds up the extractor.



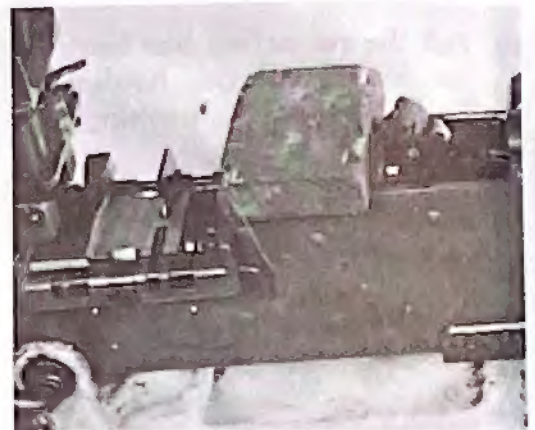
**7** Holding the retracting bar back, unlock it by pushing the lock button to the left.

is located in the receiver. It is a small, rectangular button that is pushed to the left to unlock the retracting bar. The retracting bar is a long, thin metal bar that is used to move the extractor forward and back.

**9** Lower the cover onto the T block.

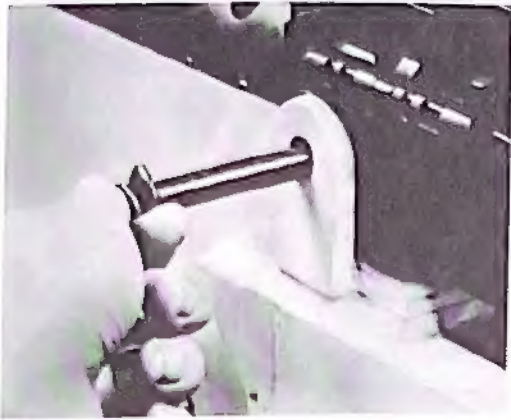


**8** Ease the bolt forward to rest against the T block.

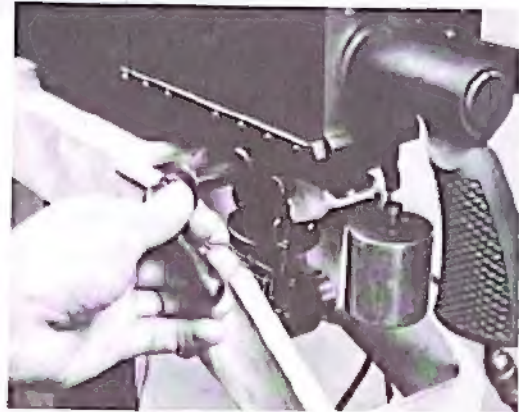




**10** Pull out the front locking pin.



**11** Pull out the back locking pin.



**12** Lift the machine gun up and out.



# DISASSEMBLING, MAINTAINING, AND ASSEMBLING THE COAXIAL MACHINE GUN

## Disassembling the machine gun.

**1** (Note: If there is a T block in the receiver of the gun, take it out.)

Feel with one finger to make sure there is no round in the chamber. (CAUTION: If there is a round in the chamber, do not disassemble the gun until the round has been taken out.)

**2** (Note: Do not close the cover.) Let the bolt go all the way forward.

**3** Make sure that the manual safety is pushed to the left so that the letter "F" shows.

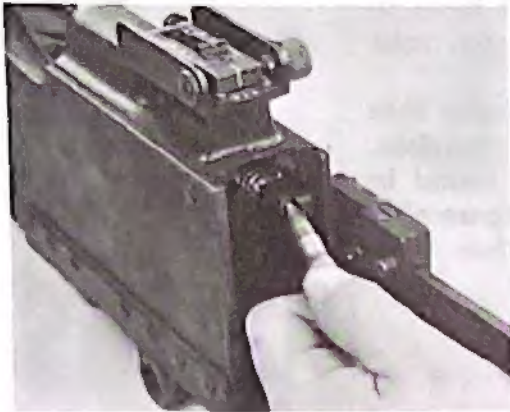
**4** (CAUTION: Make sure that the bolt is forward before taking off the backplate.)



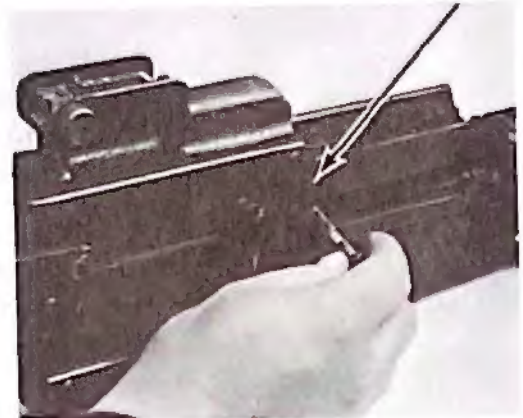
While pushing the latch lock (at the top of the backplate) to the right, push down the backplate latch and lift out the backplate.



- 5** Put the nose of a .30 caliber round into the small hole in the back of the driving spring rod, and push in and to the left so that the stud comes out of the slot in the right side of the gun. Pull the driving spring rod straight back and out.



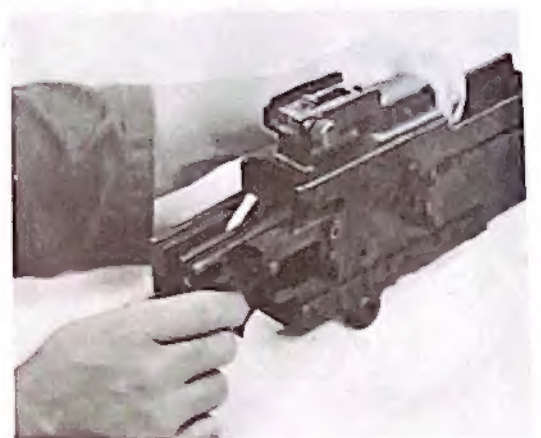
- 6** Using the retracting bar, pull the bolt stud back to the rounded slot and pull out the stud.



- 7** Push up the retracting bar and pull it out.

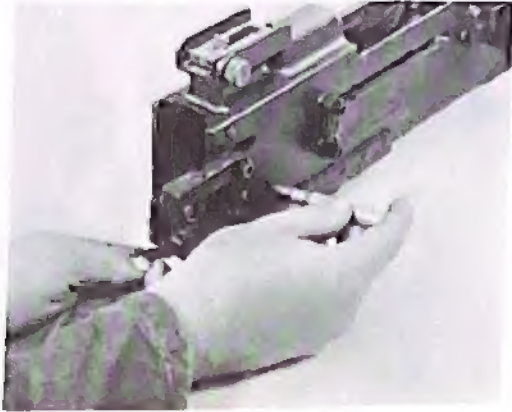


- 8** Take out the bolt.





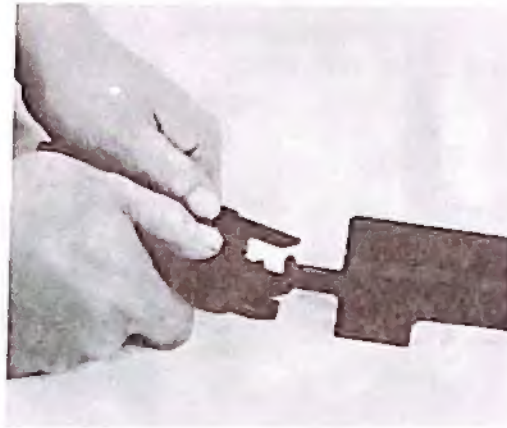
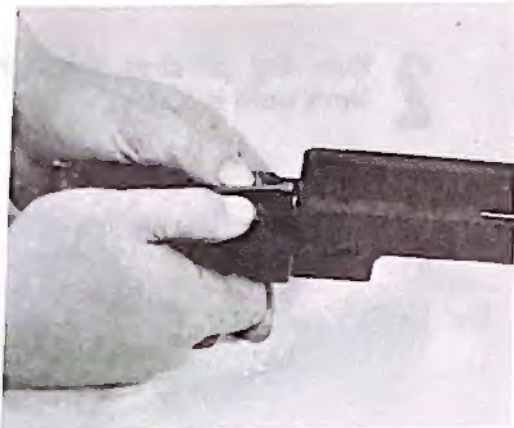
**9** Using the nose of a .30 caliber round as a tool, push in on the trigger pin on the right above the back mounting hole . . .



. . . and pull out the lock frame, barrel extension, and barrel.



**10** Push the accelerator tips forward with the thumbs, to let the lock frame snap free of the barrel extension.



**11** Unscrew the barrel from the barrel extension.



## Maintaining the machine gun before firing.

**1** Wipe off excess oil.



**2** Run dry patches through the bore until it is dry.



**3** Inspect the chamber and wipe out any oil or dirt.



**4** Check the headspace.

## **Maintaining the machine gun on the day of firing and on the next two days.**

**1** Disassemble the machine gun.

**2** If the gun is sandy or dirty, wash all the parts in solvent. If solvent is not available, clean off the sand or dirt with brushes and oily rags.

**3** Clean all the parts with bore cleaner. (Note: Run patches soaked in bore cleaner through the bore until they come out clean. If bore cleaner is not available, tell the tank commander.)

**4** Remove the front barrel bearing and scrape the carbon from the inside of the bearing. (CAUTION: Care must be taken not to scratch the bearing.)

(Note: Replace the bearing before adjusting the headspace.)





**4** Wipe the bore cleaner from all the parts except the bore, and coat them with a light coat of oil (the kind specified by ordnance).

**5** Leave a coat of bore cleaner in the bore overnight.

## Maintaining the machine gun on the third day after firing.

**1** Disassemble the machine gun.

**2** Clean all the parts with bore cleaner. (Note: Run patches through the bore until they come out clean.)

**3** Wipe the bore cleaner from all the parts and coat them with a light coat of oil (the kind specified by ordnance).



**4** Holding a white piece of paper or a clean patch at one end of the bore so as to reflect light, look through the bore to see if it is clean and free from rust and pits.



**5** If the bore is clean and rust-free, coat it with oil (the kind specified by ordnance).

**6** If the bore is dirty or rusty, clean it with bore cleaner and patches every day until it is clean, leaving bore cleaner in it overnight. When the barrel is clean, coat it with oil.

## **Maintaining the machine gun, weekly.**

(Follow the procedure for the third day after firing.)

## **Cleaning a machine gun received from storage.**

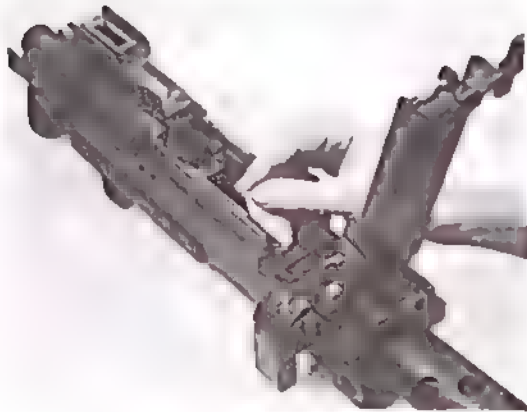
**1** Disassemble the machine gun.

**2** Clean off every trace of rust preventive compound (cosmo-line) with cleaning solvent.

**3** Coat every metal part with a light coat of oil (the kind specified by ordnance).

## Inspecting the machine gun, daily (when it has not been fired that day).

**1** Holding a white piece of paper or a clean patch in the receiver so as to reflect light, look into the muzzle to see if the bore is clean and free from rust and pits. If it is dirty or rusty, clean it.

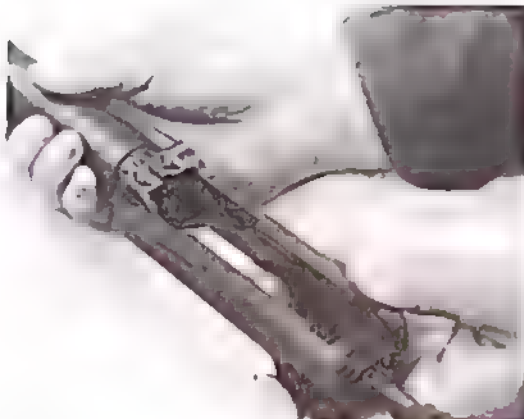


**2** Wipe off any dust or dirt.

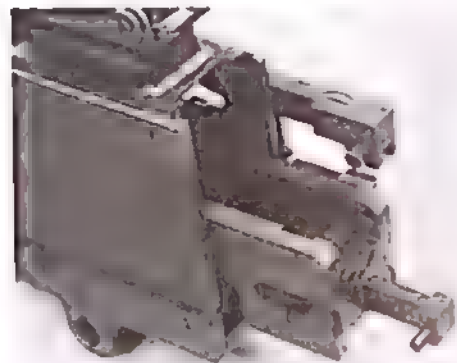
**3** Oil any dry parts. (Note: If the weapon is handled, oil it again.)

## Assembling the machine gun.

**1** Screw the barrel into the barrel extension. (Note: Screw the barrel in only until it is flush with the inside of the barrel extension.)



**2** Slide the barrel and barrel extension into the receiver; leave the T-lug sticking out, the stud pointing to the left.





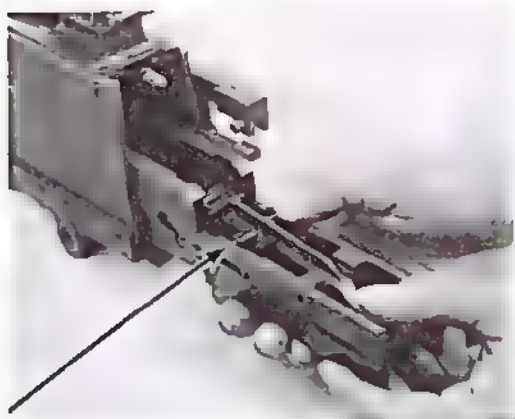
**3** Holding the lock frame with the trigger down, push the claws under the T-lug of the barrel extension . . .



. . . and push the lock frame forward so that the prongs fit into the slots in the barrel extension. (Note: Be sure that the groove in the barrel plunger fits the stud on the T-lug.)



**4** Push down the tips of the accelerator to make sure that the lock frame is locked to the barrel extension.



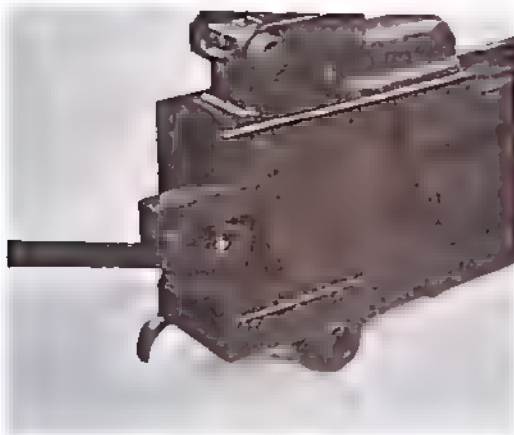
**5** Pushing in on the trigger pin, slide the lock frame all the way into the receiver until the trigger pin snaps into place.



**6** With the larger end of the driving spring rod hole at the back and up, with the cocking lever pushed forward, and pressing down on the trigger, slide the bolt in on top of the lock frame. (Note: Unless the trigger is pressed down as the bolt is slid in, the accelerators may trip. If they do, the lock frame must be re-locked to the barrel extension.)



**7** Slide the retracting bar, hook up, through the two slots as far as it will go.



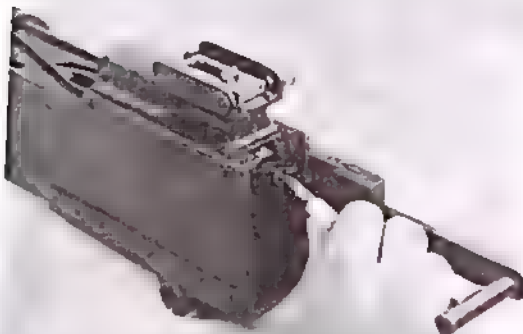
**8** Push the bolt forward until the bolt stud can be pushed into place in the right side of the bolt. Push in the bolt stud.



**9** Line up the small stud on the front of the driving spring rod with the groove in the bolt; then push the driving spring rod all the way forward.



**10** Push the nose of a .30 caliber round into the small hole in the back of the driving spring rod; push in and to the right so that the stud slides into its slot in the right side of the gun.

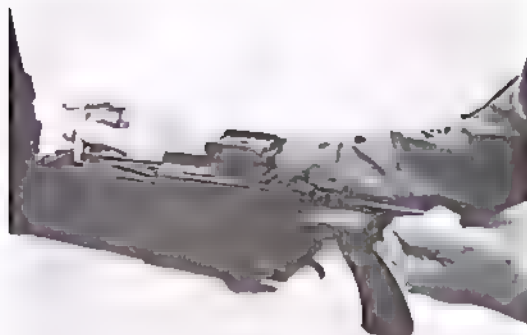


**11** Pushing the backplate latch lock to the right, push down on the backplate latch, and slide the backplate into place.

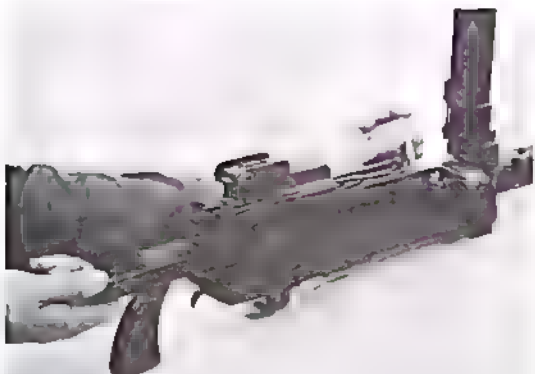


## Setting headspace on the machine gun.

- 1** Pull the retracting bar back about three quarters of an inch and hold it there.



- 3** Again pull the retracting bar back about three quarters of an inch.

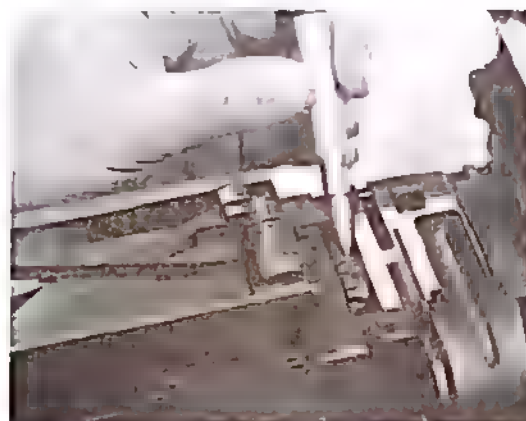


- 5** Unscrew the barrel from the barrel extension two more notches (to allow for heat expansion during firing).

- 2** Screw the barrel into the barrel extension by prying the barrel notches with a screwdriver (or similar tool) until the recoiling parts will not go fully forward, without being forced, when the retracting bar is released (from the  $\frac{3}{4}$ -inch position).



- 4** Unscrew the barrel from the barrel extension, one notch at a time, until the recoiling parts, without forcing, will go fully forward when the retracting bar is released (from the  $\frac{3}{4}$ -inch position).



## Checking the assembly of the machine gun.

- 1** Close the cover.
- 2** Pull back the retracting bar and release it, letting the bolt go forward.
- 3** Lift the trigger, listening for the click. If there is one, the gun has probably been correctly assembled. If the trigger will not lift, make sure the manual safety is pushed to the left so that the letter F shows. If there is no click, reassemble the gun.



# INSTALLING THE COAXIAL MACHINE GUN

## Mounting the Coaxial Machine Gun.

**1** Feel with one finger to make sure there is no round in the chamber. (CAUTION: If there is a round in the chamber, do not install the gun until the round has been taken out.)

**2** Insert the barrel in the machine gun port, setting the gun in the mount so that the front mounting holes of the gun are lined up with the front holes in the mount.



**3** Push in the front locking pin.



**4** Lift up the elevating and traversing mechanism to line up its holes with the back mounting holes of the gun. (If the holes line up, go on to Step 6.)





## **5** If the mounting holes are too far to one side,

(a) Using a 5/16-inch allen wrench, loosen the lock nut at the bottom of the elevating and traversing mechanism (to free the traversing handwheel).



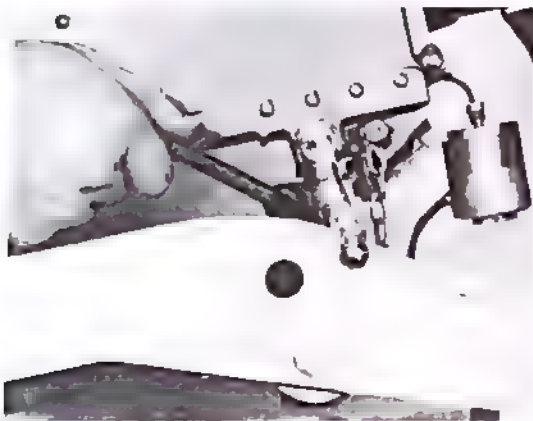
(b) Turn the traversing handwheel.



(c) Lift up the elevating and traversing mechanism to line up its holes with the back mounting holes of the gun.

If the mounting holes are too high or too low,

(a) Using the 5/16-inch allen wrench, loosen the two lock nuts on the left side of the elevating and traversing mechanism (to free the elevating handwheel).



(Note: For the lower lock nut, put the wrench through the hole in the mount.)



(b) Turn the elevating hand-wheel.

(c) Lift up the elevating and traversing mechanism to line up its holes with the back mounting holes of the gun.

**6** Push in the back locking pin.



**7** Look at the barrel of the machine gun where it enters the machine gun port, to make sure that it is centered in the port. If the barrel is centered, go on to Step 9.

**8** If the barrel is too far to one side,

(a) Make sure that the lock nut at the bottom of the elevating and traversing mechanism is loose.

(b) Turn the traversing hand-wheel until the barrel is centered right and left.

If the barrel is too high or too low,

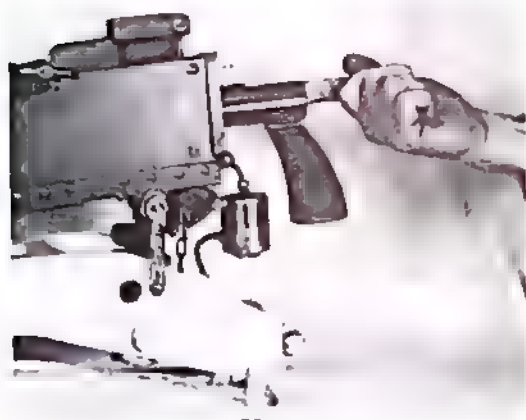
(a) Make sure that the two side lock nuts on the traversing mechanism are loose.

(b) Turn the elevating hand-wheel until the barrel is centered up and down.

**9** Using the 5/16-inch allen wrench, tighten the bottom and side lock nuts on the elevating and traversing mechanism.

## Adjusting the Solenoid.

**1** Lift up the bolt handle, pull it all the way back, and let it go forward to cock the gun.  
(Note: Cocking the gun takes the play out of the trigger.)

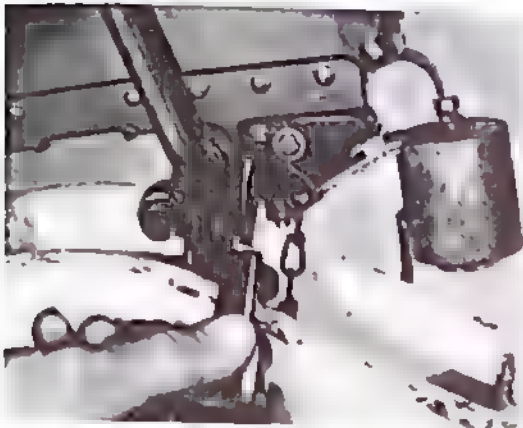


**2** See if there is a clearance of about the thickness of a dime between the trigger and the top of the solenoid (the solenoid plunger). If the clearance is about the thickness of a dime, go on to Step 4.

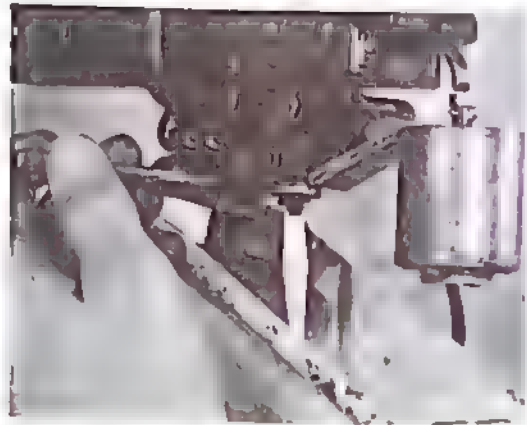


**3** If the clearance is either larger or smaller than the thickness of a dime,

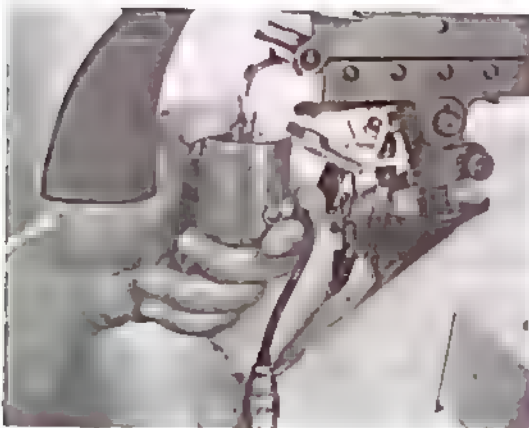
(a) Using a screwdriver, loosen the lock screw. (Note: On most mounts, the lock screw is on the left, behind the back locking pin; on some mounts the lock screw is on the right; and some mounts have no lock screw.)



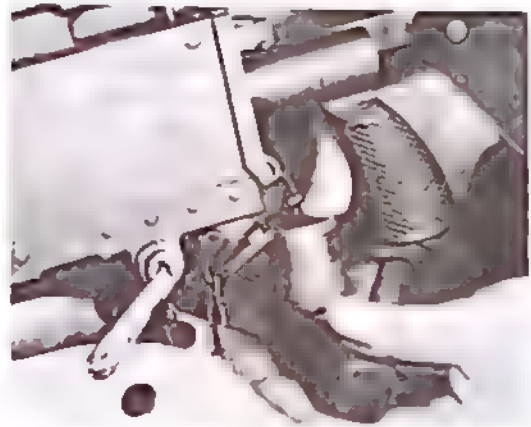
(b) Holding the adjusting screw with the screwdriver, use a 7/16-inch open-end wrench to loosen the two jam nuts on the adjusting screw.



(c) (Note: Make sure that the gun is cocked.) Pushing down on the top of the solenoid so that it cannot wobble, turn the adjusting screw until the clearance is about the thickness of a dime.

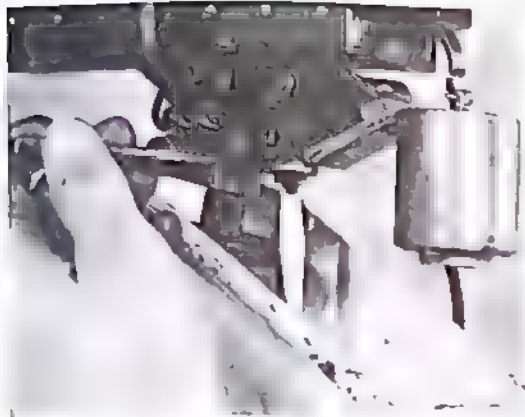


(d) Still pushing on the top of the solenoid, tighten the lock screw.





(e) Holding the adjusting screw with the screwdriver, tighten the two jam nuts on the adjusting screw.



(f) Make sure that the clearance between the solenoid plunger and the trigger is about the thickness of a dime.

**4** Ask the driver to turn on his MASTER switch.

**5** Ask the gunner to,

(a) Turn on the LEFT GUN switch . . .

(b) . . . and press the trigger on the power control handle or the firing button on the manual elevation handle.

**6** Watch the solenoid plunger push up the trigger, and listen for the loud click as the machine gun "fires."

**8** If the solenoid plunger does not move when the gunner presses the trigger, tell the tank commander.

**7** If the solenoid plunger moves when the gunner presses the trigger, but does not "fire" the gun, adjust the clearance following the procedure of Step 3 until the gun "fires" when the gunner presses the trigger.

## Installing the link chute and the brass bag.

- 1** Pull out the right belt holding pawl on the right side of the gun.



- 2** With the chute end down, insert the finger of the link chute into the feedway of the gun, and seat it so that the holes in the chute line up with the pin holes.



(Note: Make sure that the finger of the link chute is not bent down. If it is, it will catch the links, causing a stoppage. If necessary, pry it up a little.)

- 3** Slide the right belt holding pawl back in.

- 4** Push the top of the brass bag up through the metal rod under the mount, and snap the fasteners over the rod to hold the bag in place.



# BORESIGHTING THE COAXIAL MACHINE GUN

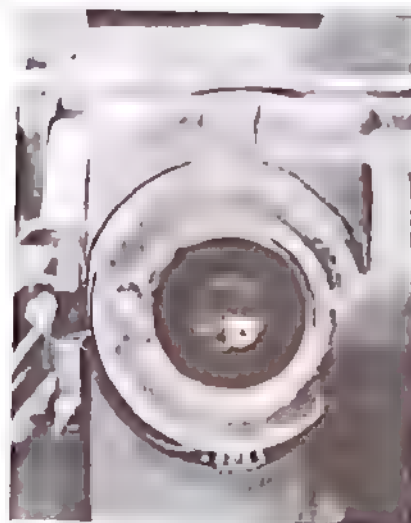
**1** Unload the gun.

**2** Take out the bolt.

**3** Using the right telescope of the binocular, look through the barrel of the gun . . .

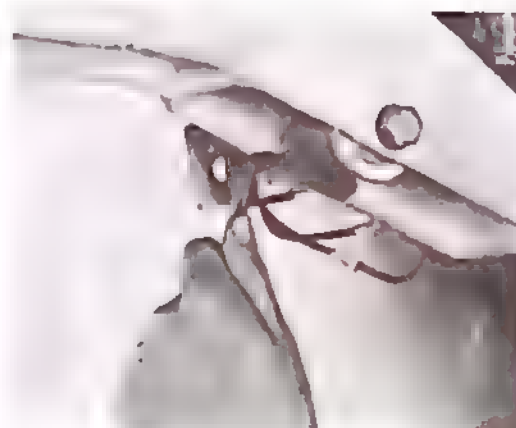
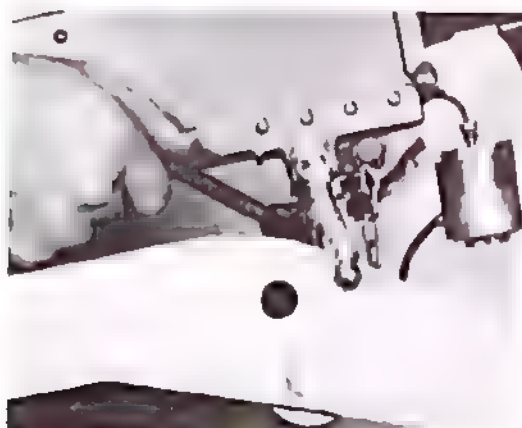


. . . to see if the barrel is centered on the aiming point of the bore-sighting target.

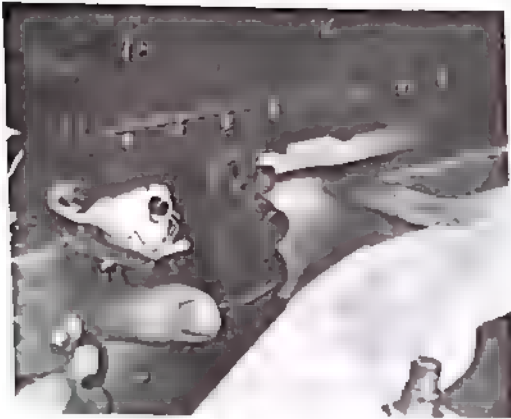


**4** If the barrel is not centered on the aiming point,

(a) Using an allen wrench, loosen the lock nuts for the elevating wheel, the traversing wheel, or both, as necessary.



**(b) Turn the elevating wheel, the traversing wheel, or both, to center the barrel on the aiming point.**



**(c) Tighten the lock nuts.**

**(d) Make sure that the barrel is still centered on the aiming point.**

**(e) Put the bolt back in the gun.**

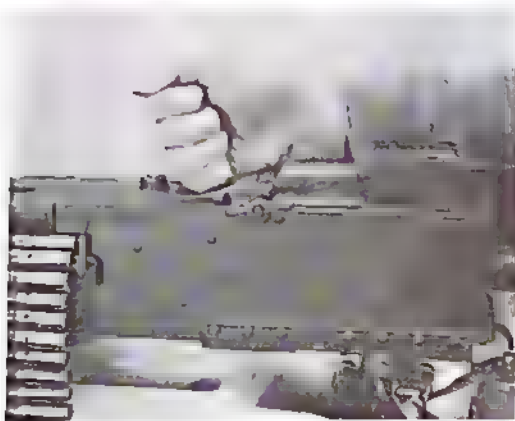


# TAKING IMMEDIATE ACTION IN CASE OF A STOPPAGE OR A RUNAWAY OF THE COAXIAL MACHINE GUN

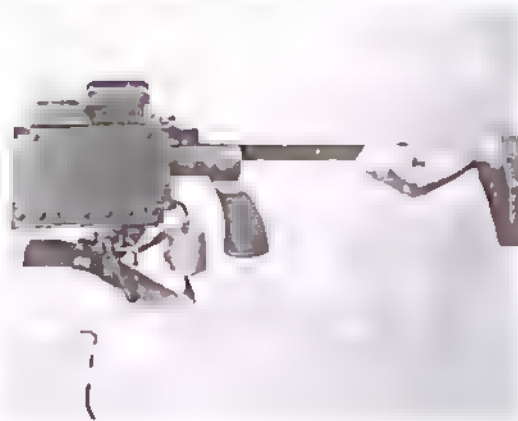
**Taking immediate action if there is a stoppage.**

(Note: If the gun will not fire, make sure that the safety is pushed to the left, so that the letter F shows.)

- 1** Tap the cover to make sure it is closed.



- 2** Pull the retracting bar back and release it. (Note: If the bolt cannot be pulled back, tell the tank commander that the coaxial machine gun is out of order.)



- 3** If the bolt does not go forward when it is released, raise the cover and take out the round that is jammed . . .



. . . re-load, announce "UP," and wait for the gunner's attempt to fire.

- 4** If the gun still will not fire, pull the bolt back twice and see if the belt feeds. If the belt does not feed, tell the tank commander that the coaxial machine gun is out of order.

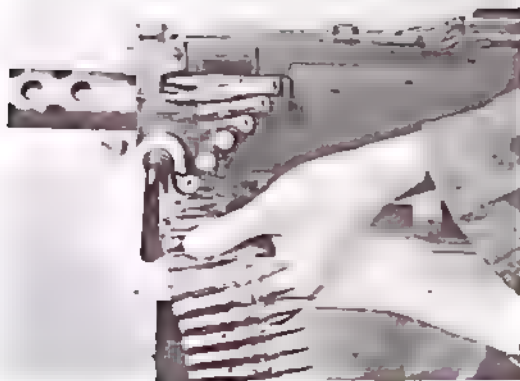


- 5** If the belt feeds and if the gun still will not fire, take out the bolt and put in a new one.

- 6** If the gun still will not fire, tell the tank commander that the coaxial machine gun is out of order.

## **Taking immediate action in case of a runaway.**

- 1** Twist the belt to block the gun from firing.



- 2** Unload the gun.

- 3** Remove the lock frame and replace the trigger.

# DISASSEMBLING AND ASSEMBLING THE BOLT OF THE COAXIAL MACHINE GUN

## Disassembling the bolt.

**1** Remove the back plate and driving spring assembly to take out the bolt.

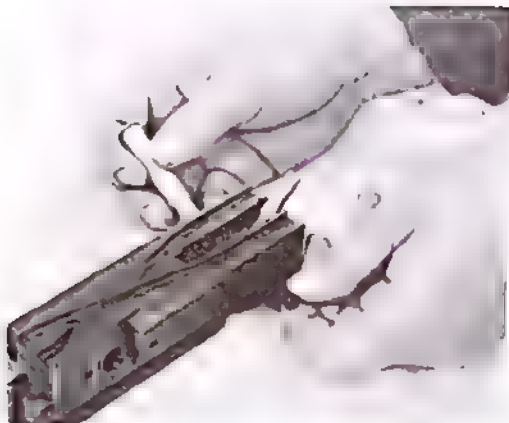
**2** Pull the extractor off the left side of the bolt.



**3** Pull back the cocking lever.



**4** Using the tip of a .30 caliber round, push the cocking lever pin out . . .



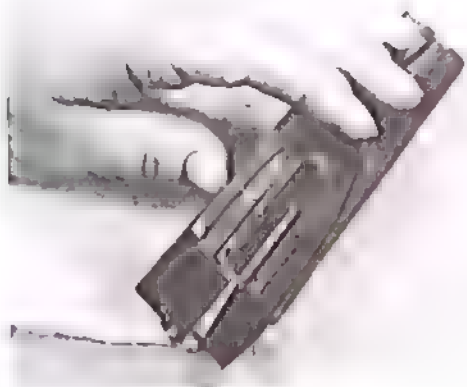
. . . and take out the cocking lever.



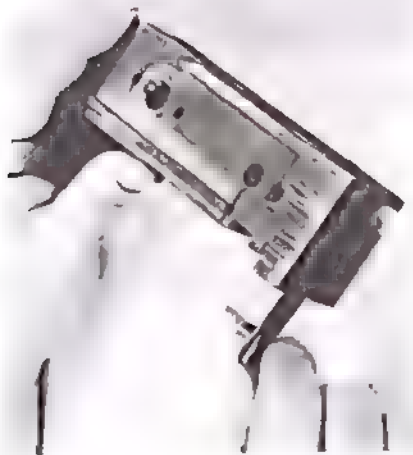
- 5** Using the cocking lever as a tool, push down hard on the sear until there is a click.



- 6** Using the cocking lever, push the sear spring down a little and to the left until the spring is locked in the slot in the side of the bolt.



- 7** Let the sear slide out.

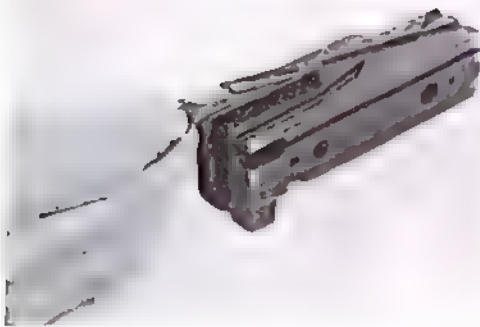


- 8** Using the cocking lever, pry the sear spring out of the slot.





**9** Using the flat end of the cocking lever, pry out the sear spring.

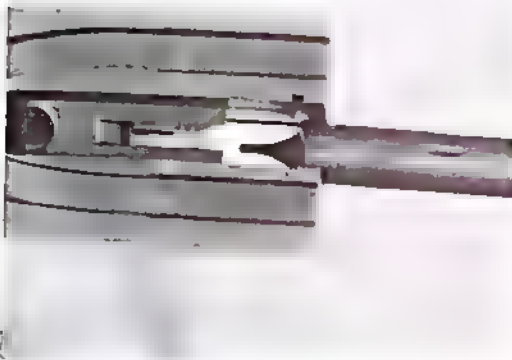


**10** Let the firing pin slide out of the bolt.



## Assembling the bolt.

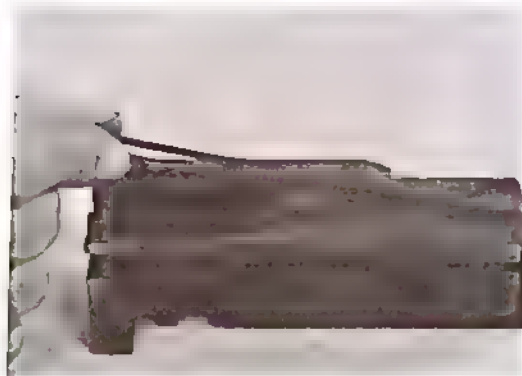
**1** With the striker end first . . .



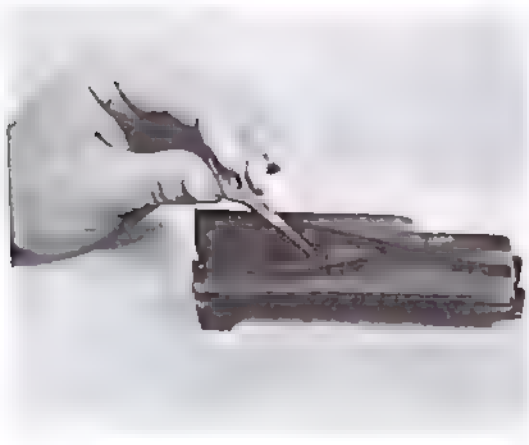
. . . and the lug down, slide the firing pin into the bolt.



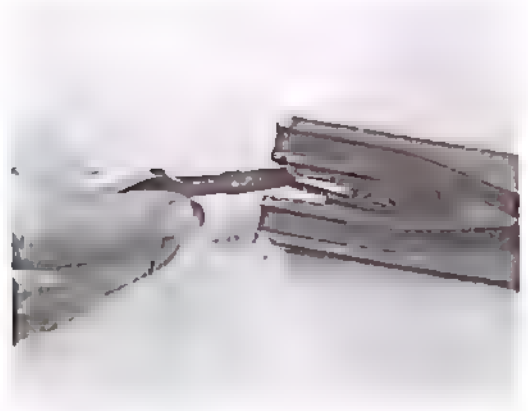
**2** Push the sear spring pin into its hole.



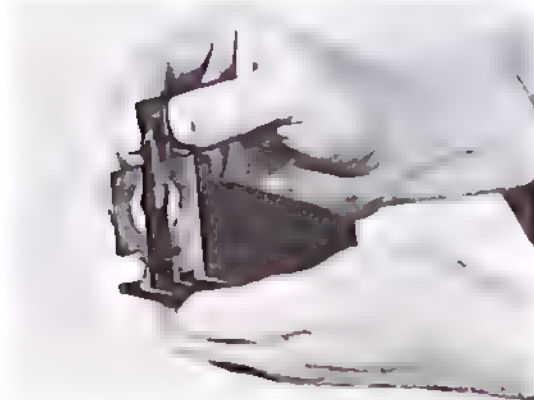
- 3** Using the cocking lever as a tool, push the sear spring pin down and seat the sear spring.



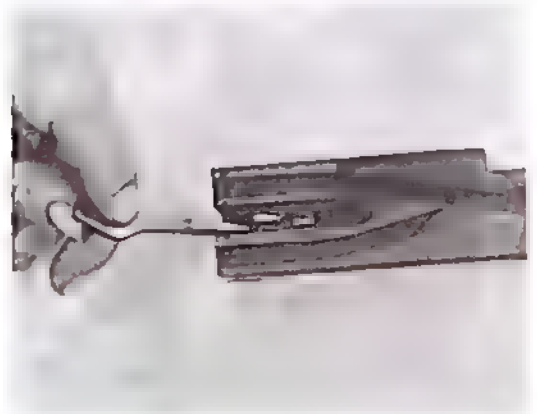
- 4** Using the cocking lever, push the sear spring down a little and to the left to lock the spring in the slot in the side of the bolt.



- 5** Slide the sear up into place in the bolt so that the bottom of the L points toward the front of the bolt.



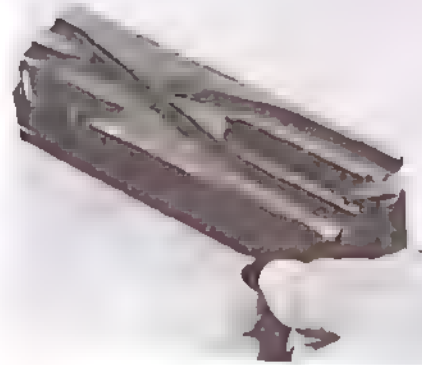
- 6** Holding the sear in place, use the cocking lever to pry the sear spring out of its slot.



**7** With the hooked end down and facing to the rear of the bolt, push the cocking lever down into the front of the slot in the bolt, and fit it through the slot in the firing pin.



**8** Push the cocking lever pin into its hole in the left side of the bolt.



**9** Push the cocking lever forward to cock the firing pin.



**10** Push the extractor into its hole in the left side of the bolt.



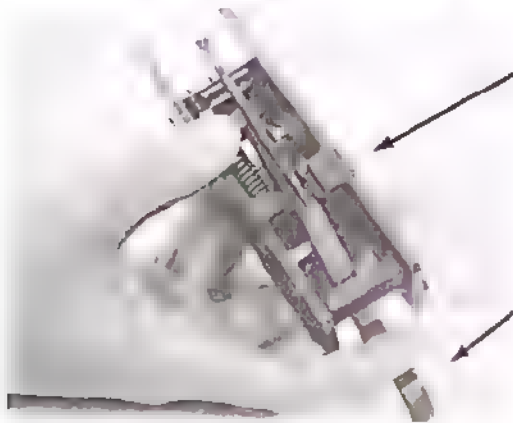
# **TROUBLE-SHOOTING MALFUNCTIONS OF THE COAXIAL MACHINE GUN**

## **Locating the source of difficulty when the gun fails to fire.**

**1** Take out the bolt and put in  
a new one.

**2** If the gun still fails to fire,

(a) Disassemble the gun to see  
if the trigger or trigger pin is  
broken. If so, put in a new one;



(b) See if the trigger cams  
(which fit into the sear cams) are  
worn or broken. If so, install a new  
trigger;



(c) See if the sear cams are  
worn. If so, install a new sear;



(d) If none of these parts are  
worn or broken, tell the tank com-  
mander that the coaxial machine  
gun cannot be repaired with OVM  
parts.

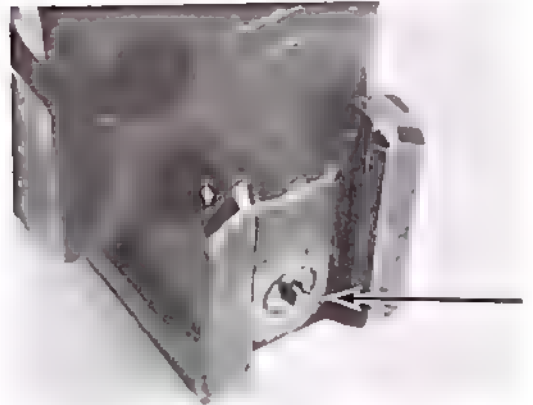


### **3** If the gun fires with the new bolt, trouble-shoot the old bolt:

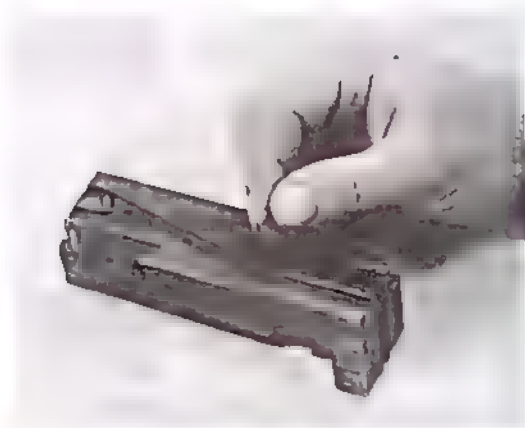
**(a)** If necessary, push down the sear to let the firing pin go forward;



**(b)** See if the firing pin striker is broken. If so, put in a new firing pin;



**(c)** Push the cocking lever forward to cock the firing pin.

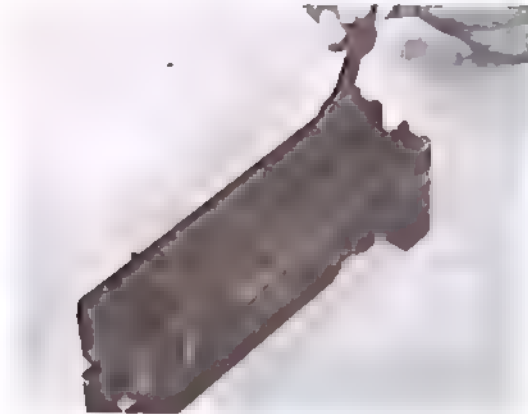


**4** If the cocking lever can be pushed forward freely, without pressure,

(a) Pull out the cocking lever pin and see if it is broken. If it is, put in a new one;



(b) Take out the cocking lever and see if it is broken. If it is, put in a new one;



(c) See if the firing pin spring is weak (using a new firing pin to test it) or broken. If it is, put in a new firing pin;

(d) See if the sear spring pin is broken. If it is, put in a new sear spring.



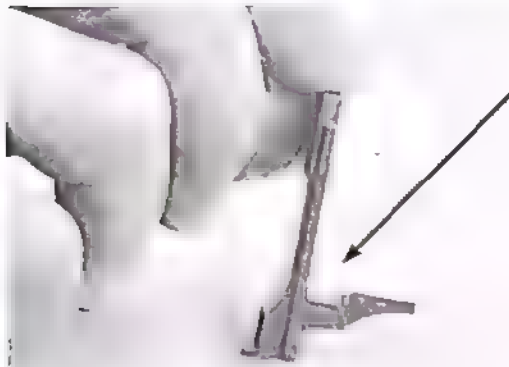
**5** If the firing pin will not stay cocked,

(a) See if the sear spring is weak. (Test, using a new spring.) If the spring is weak, put in a new one;

(b) See if the lug on the bottom rear of the firing pin is worn. If it is, put in a new firing pin;



(c) See if the sear notch (that contacts the lug on the firing pin) is worn. If it is, put in a new sear.



## Locating the source of difficulty with a runaway gun.

**1** Remove the lock frame and replace the trigger.

**2** If the gun still runs away, tell the tank commander that the coaxial machine gun cannot be repaired with OVM parts.

**3** If the gun fires properly with the new bolt, trouble-shoot the old bolt as follows:

(a) See if the sear spring is weak. (Test, using a new spring.) If the old spring is weak, install a new one;

(b) See if the lug on the bottom rear of the firing pin is worn. If it is, put in a new firing pin,

(c) See if the sear notch (that contacts the lug on the firing pin) is worn. If it is, put in a new sear.

# DISASSEMBLING, MAINTAINING, AND ASSEMBLING THE SUBMACHINE GUN

**Unloading the submachine gun before disassembling it.**

- 1** Push in the magazine catch and take out the magazine.



- 2** Open the cover and pull back the bolt.



- 3** Look and feel to make sure there is no round in the chamber or receiver.



- 4** Pull the trigger.



- 5** Close the cover.



## Disassembling the submachine gun.

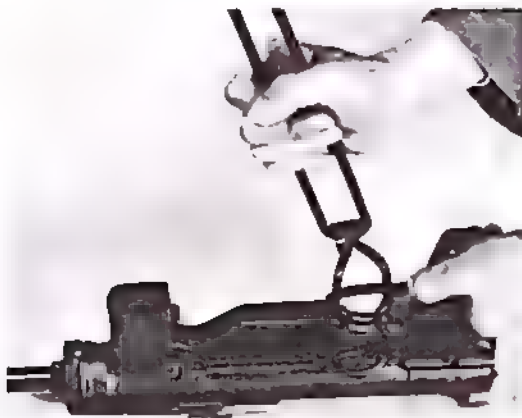
**1** Take off the sling.



**2** Push in the stock catch on the left side of the pistol grip and pull off the stock.



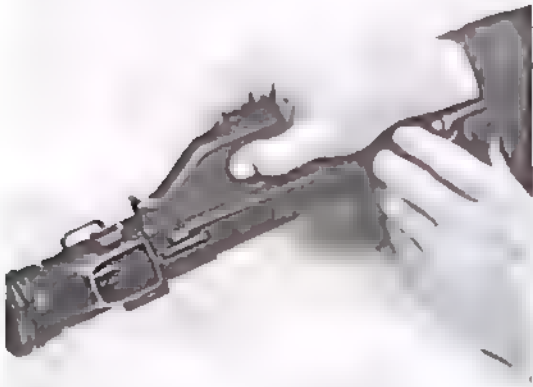
**3** Insert the closed end of the stock through the trigger guard, pry the end of the trigger guard out of the pistol grip . . .



. . . and take off the trigger guard.



**4** Pull the housing up and take it off.



**5** Take off the magazine catch.



**6** Push down the barrel ratchet which is clamped against the barrel and unscrew the barrel.



(Note: If the barrel is "frozen" on, fit the prongs of the stock over the barrel, squeeze them together, and use them as a tool.)



**7** Open the cover.



**8** Tip the front of the gun down and let the bolt and the guide rod group slide out.



**9** Push the sear pin and take it out (from in front of the double-pronged trigger pin).



**10** Lift out the double-pronged trigger pin.



- 11** Turn the receiver upside down and let both trigger connector and sear slide out through the barrel end.

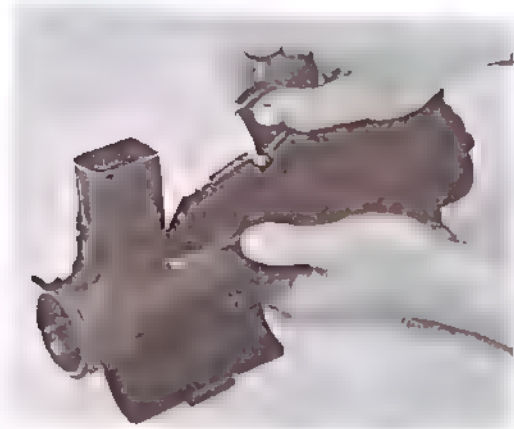


## Assembling the submachine gun.

- 1** Turn the receiver upside down.

- 2** Holding the trigger up and toward the pistol grip, drop the trigger connector and sear into the receiver.

- 3** Turn the receiver upright and let the trigger slip into place.



- 4** Pull the trigger down so that its bottom rests on the bottom of the slot.



- 5** Pull the trigger forward until the hole in the trigger lines up with the hole in the receiver.

- 6** Push in the double-pronged trigger pin.



- 7** Push the sear in until it is entirely inside the receiver.





**8** Pushing the sear up and pulling the trigger, line up the hole in the sear with the hole in the receiver and . . .



. . . push in the sear pin.

(Note: Be sure to use the hands as the picture shows.)



**9** Slide the bolt and guide rod group (guide rods first, and safety recess up) into the receiver so that the lugs on the bolt ride into the grooves in the screw threads.



**10** Close the cover.

**11** Push down the barrel ratchet which clamps against the barrel and screw in the barrel until it is finger tight.



**12** Holding the magazine catch so that the numbers on the bar can be read . . .



. . . slip the shield so the slot in the shield fits over the magazine catch.



. . . and push up the shield and fit it over the spring.



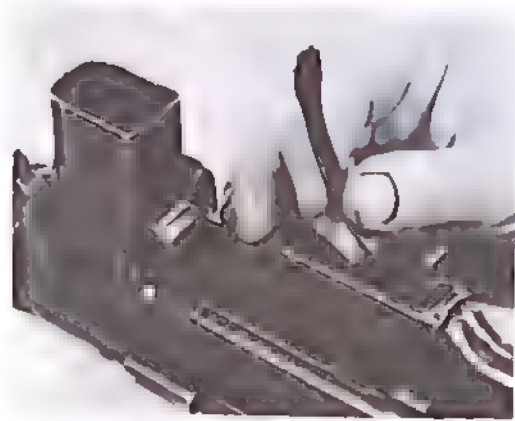
**13** Clip the magazine catch back on the receiver.



- 14** Put the housing back in place so that it fits into the slot below the magazine catch.



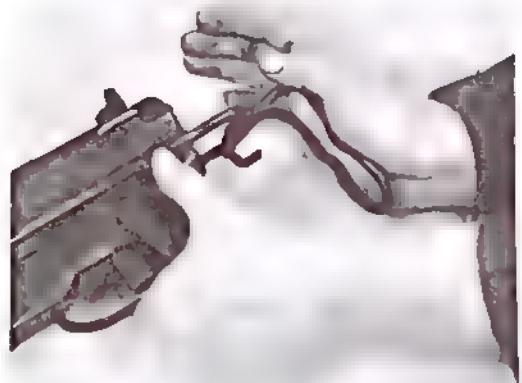
- 15** Turn the hooked end of the trigger guard into the slot at the rear of the housing.



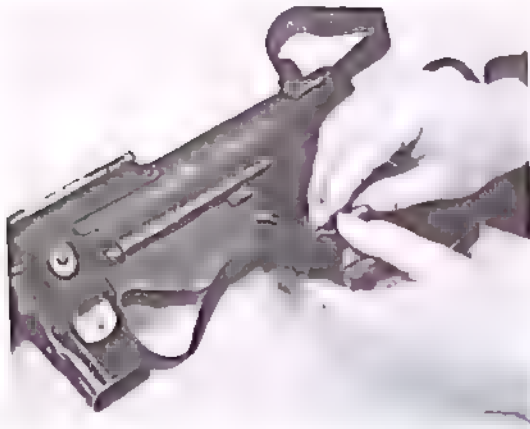
- 16** Press the trigger guard with the thumb until it snaps into the slot in the pistol grip.



- 17** Push in the stock catch and slide the prongs of the stock into place, shoulder end down.



**18** Put the sling back on.



**19** Push the magazine into place.

### Checking the operation of the submachine gun after assembling.

**1** Remove the magazine and open the cover.

**3** Close the cover.

**5** Open the cover.

**2** Pull back the bolt. If it does not stay back, tell the tank commander that the submachine gun is out of order.

**4** Pull the trigger. If the bolt goes forward, tell the tank commander that the submachine gun is out of order.

**6** Pull the trigger. If the bolt does not go forward, tell the tank commander that the submachine gun is out of order.

## Maintaining the submachine gun before firing.

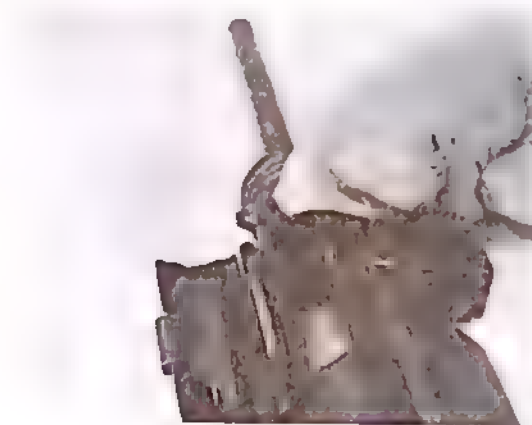
**1** Wipe off the excess oil.



**2** Run dry patches through the bore until it is completely dry.



**3** Inspect the chamber and wipe out any oil or dirt.





# Maintaining the submachine gun on the day of firing and on the next two days.

- 1** Disassemble the submachine gun.



- 2** If the gun is sandy or dirty, wash the parts in solvent. If solvent is not available, clean off the sand or dirt with brushes and oily rags.

- 3** Clean all the parts with bore cleaner. (Note: Make sure that primer salts—gray-white powder—are cleaned from the face of the bolt. Run patches soaked in bore cleaner through the bore until they come out clean. If bore cleaner is not available, hot soapy water or sal soda solution may be used. Do not use hot soapy water or sal soda solution on the other parts of the gun.)



- 4** Wipe the bore cleaner from all the parts except the bore, and coat them with a light coat of oil (the kind specified by ordnance).



- 5** Leave a coat of bore cleaner in the bore overnight.

## Maintaining the submachine gun on the third day after firing.

**1** Disassemble the submachine gun.

**2** Clean all the parts with bore cleaner. (Note: Make sure that the primer salts—gray-white powder—are cleaned from the face of the bolt. Run patches through the bore until they come out clean.)

**3** Wipe the bore cleaner from all the parts and coat them with a light coat of oil (the kind specified by ordnance).

**4** Holding a white piece of paper or a clean patch so as to reflect light through the bore, look through the bore to see if it is clean, and free from rust and pits.

**5** If the bore is clean and rust-free, coat it with oil (the kind specified by ordnance).

**6** If the bore is dirty or rusty, clean it with bore cleaner and patches, and leave bore cleaner in it overnight. (Do so every day until the bore is clean.) When it is clean, coat it with oil.



## Inspecting the submachine gun, daily (when it has not been fired that day).

**1** Holding a white piece of paper or a clean patch in the receiver so as to reflect light, look through the muzzle end of the bore to see if it is clean and free from rust and pits. If it is dirty or rusty, clean it.



**2** Wipe off any dust or dirt.

**3** Oil any dry parts. (Note: If the weapon is handled, oil it again.)



# **Maintaining the submachine gun, weekly.**

(Follow the maintenance procedure for the third day after firing.)

## **Cleaning a submachine gun received from storage.**

- 1** Disassemble the submachine gun.
- 2** Clean off the traces of rust preventive compounds with cleaning solvent.
- 3** Coat the metal parts with a light coat of oil (the kind specified by ordnance).

# STOWING 90-MM AMMUNITION

## Inspecting the rounds.

**1** Clean all dirt from the rounds.



**2** Inspect each cartridge case . . .

. . . and rotating band for dents and bulges. If there are any found, do not stow the round; tell the tank commander.





**3** Try to wobble each projectile.  
If one is loose, do not stow the  
round, and tell the tank com-  
mander.



**4** Inspect every chemical round  
for corrosion near fuzes . . .



. . . and near the bottom. If any  
corrosion is found, do not stow  
the round; tell the tank commander.

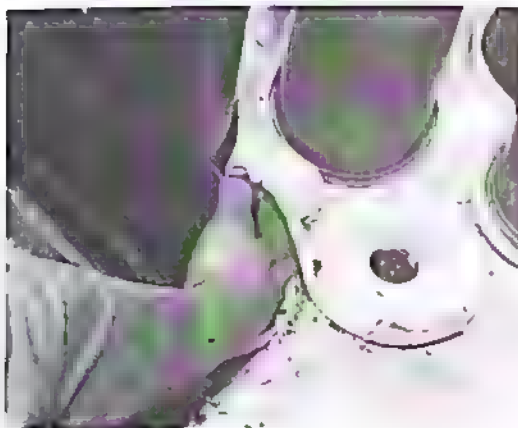


## Stowing the rounds.

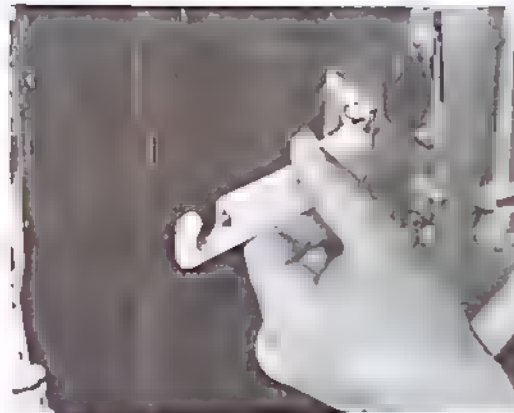
- 1** Make sure that rounds are passed from the ground into the tank with the primer up and covered by the hand.



- 2** Stow 16 rounds in the ready racks (kinds as specified by the tank commander). Seat the primer end of each round carefully in its cup on the turret floor . . .



. . . swing the hinge of the holder up and to the left . . .

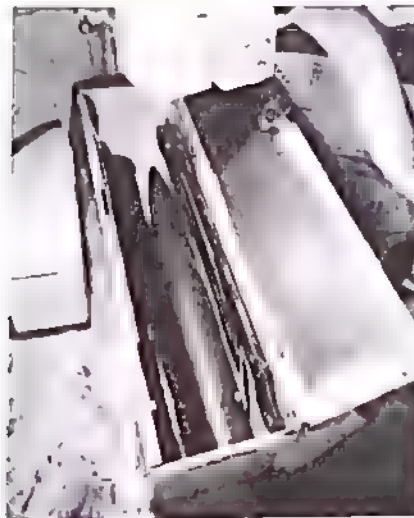


... pull out the spring-loaded knob on the rod of the holder and slide the slot in the hinge over the rod and behind the spring-loaded knob ...

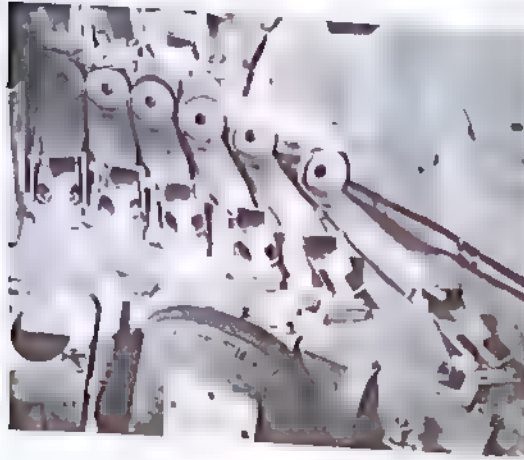


... and release the knob.

**3** Stow 6 rounds of the kinds specified by the tank commander in the box under the gun, 3 pointing one way and 3 the other.



**4** Stow 8 rounds of the kinds specified by the tank commander in the racks in the turret bustle.



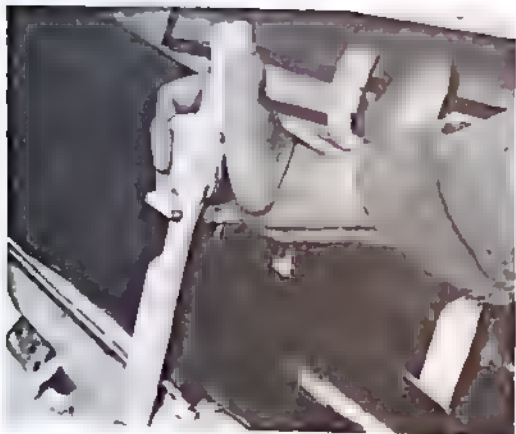
(a) Seat each round carefully, nose toward the inside of the turret.



(b) Swing the hinge up and to the left.



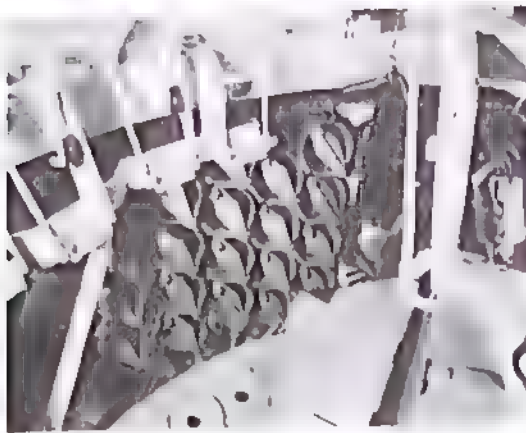
(c) Pull up the clamp, and fit the slot in the hinge in place below the clamp.



(d) Push down the clamp and lock the hinge in place.



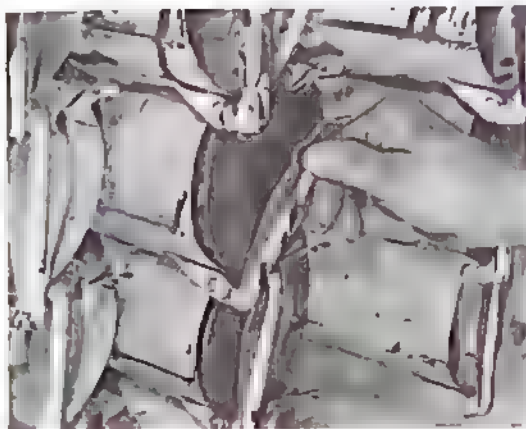
**5** Stow 19 rounds, as specified by the tank commander, in the racks in the hull to the left of the driver.



(a) Push each round into its rack nose first.



(b) Swing the hinge over the primer end of the round.



(c) Make sure that the hinge is securely clipped in place.



**6** Stow 11 rounds, as specified by the tank commander, in the racks in the hull to the right of the driver.

(a) Push each round into its rack nose first.

(b) Swing the hinge over the primer end of the round.

(c) Make sure that the hinge is securely clipped in place.



# STOWING SMALL ARMS AMMUNITION

## Stowing rounds for the coaxial machine gun.

**1** Stow 2200 rounds in the turret wall box.

(a) Unpack nine 250-round boxes of .30 caliber machine gun ammo.



(b) Fold one 250-round belt into the wall box, single-link end first.



(c) Link a second 250-round belt to the double-link end of the first belt, a third belt to the second belt, and so on, until 8 belts and 200 rounds from the ninth belt have been folded into the wall box.



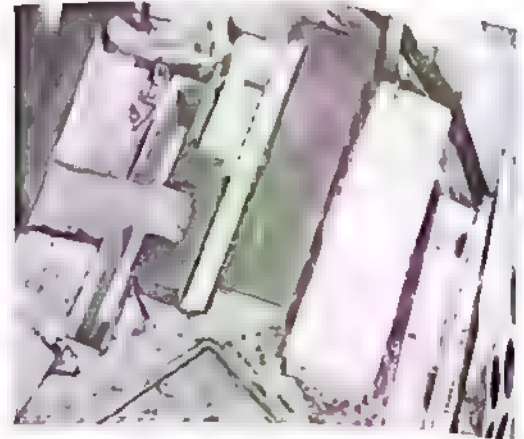
**2** Stow 2200 rounds in the turret floor box in front of the gunner.

(a) Unpack nine 250-round boxes of .30 caliber machine gun ammo.

(b) Without linking them together, fold 8 belts, and 200 rounds from the ninth belt into the floor box.



**3** Stow 6 unopened 250-round boxes in the 3 floor boxes under the breech of the gun.



## Stowing rounds for the submachine gun.

Stow six 30-round magazines of submachine gun ammo in the sub-machine gun ammo carrying case in the rack behind the tank commander.

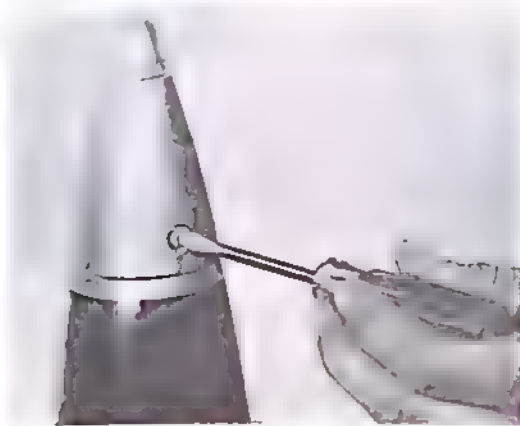


## SETTING FUZES ON HE AMMUNITION

(Note: As shipped, HE ammunition is set on SQ, super-quick.)

### Setting the fuze on delay.

Using a screwdriver or a similar tool, turn the slot in the nose of the round from SQ . . .



. . . to line up with the DELAY mark.



### Setting the fuze on super-quick.

Using a screwdriver or a similar tool, turn the slot in the nose of the round from DELAY to line up with the SQ mark.

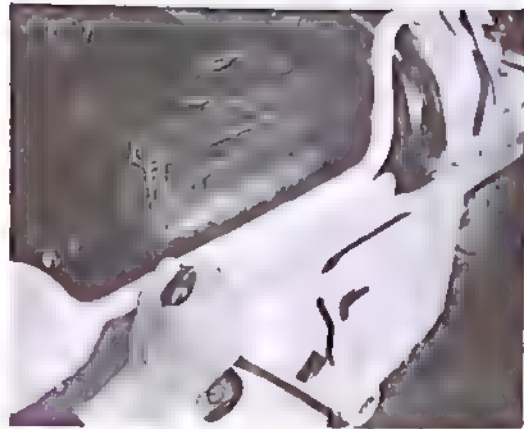
# LOADING THE MAIN GUN

## Preparing to load.

- 1** Take off the breech cover and stow it in the turret bustle.



- 2** Pull the operating handle down to open the breech.

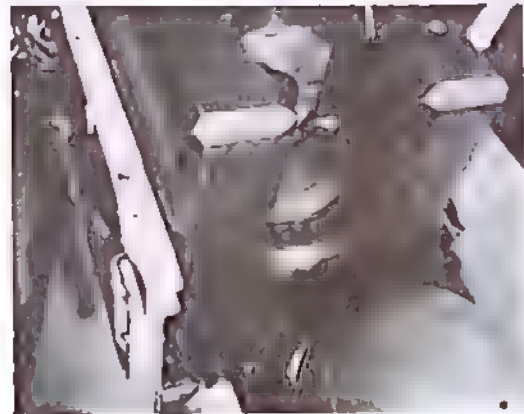


- 3** Re-latch the operating handle.

- 5** Flip the safety lever forward (so that the word **SAFE** shows).



- 4** Look through the tube to make sure it is clear.



## Loading battlesight ammunition.

**1** Select the ammunition from the ready-rack (identifying it by the markings).

**2** Pull out the knob on the ready-rack holder.



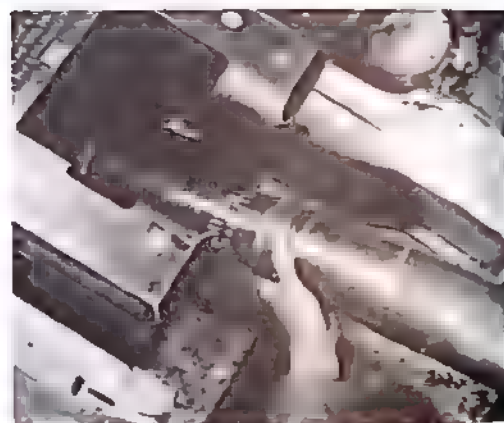
**3** Pull the nose of the round forward.



**4** Cup one hand over the primer.



**5** Lift the round up and push it (nose first) up, over, and into the breech. (Note: Do not carry the round back around the side of the breech.)



**6** Push the round about half way into the chamber.



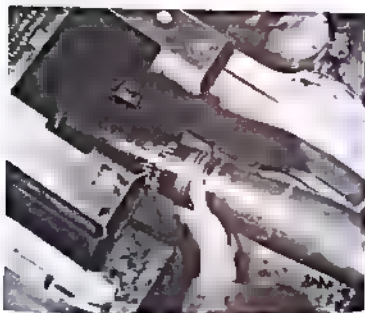
## attlesight ammunition.

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ack (identifying it by  
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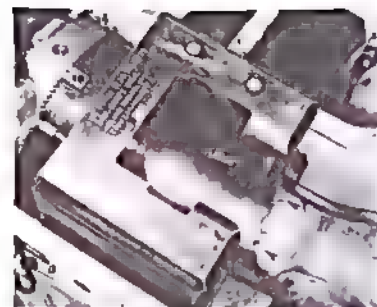
- 3 Pull the nose of the round forward.



- 5 Lift the round up and push it (nose first) up, over, and into the breech. (Note: Do not carry the round back around the side of the breech.)



- 7 (CAUTION: Keep the body out of the path of recoil of the breech.) Making a fist with the right hand, push hard with the heel of the hand; follow through to seat the round in the chamber and to clear the elbow out of the path of recoil.



## Loading in response to a fire command (with battlesight ammunition in the gun).

Example: GUNNER . . . SHOT . . . TANK . . . FIRE.

At the word SHOT, the loader begins to load.

- 1 Make sure that no crewman has any part of his body in the path of recoil of the gun.

- 2 Flip the safety lever back (so that the word SAFE does not show).



- 3 Call out, "UP," whether or not the ammunition in the gun is the kind called for in the fire command.

(Safety precaution: In Steps 4 to 8, take great care not to place any part of the body in the path of recoil of the breech.)

**4** Select from the ready-rack the kind of ammunition called for in the fire command (identifying it by the markings).

Examples:

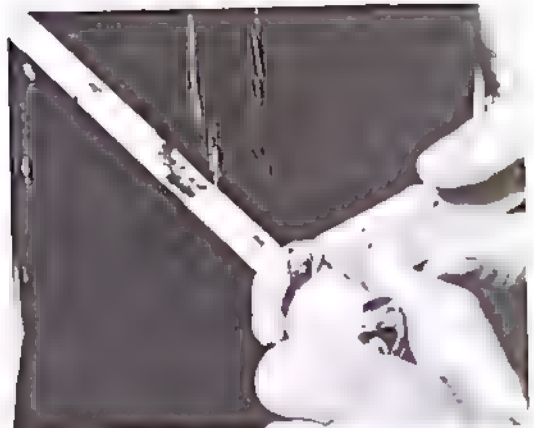
HE, olive drab with yellow markings;

WP, gray with yellow markings;

SHOT, black with white markings;

HYPER-SHOT (HVAP), also black with white markings.

**5** Pull out the knob on the ready-rack holder.



**6** Pull the nose of the round forward.



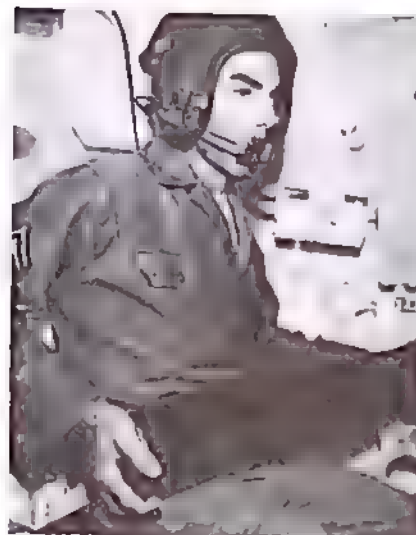
**7** Cup one hand over the primer.



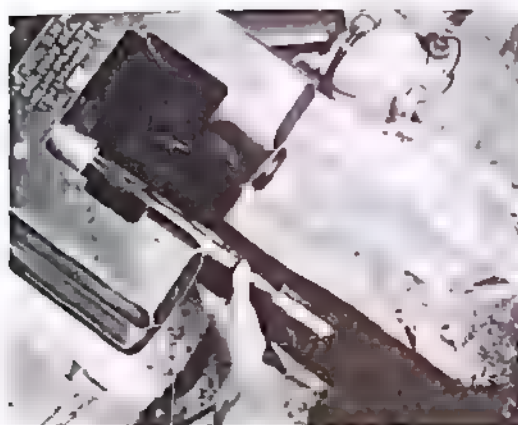
- 8** Take the round from the ready-rack.



- 9** If the gun has not yet been fired, sit in the loader's seat and hold the round.



- 10** After the gun is fired, lift the round and push it (nose first) into the breech.



- 12** Make sure that no crewman has any part of his body in the path of recoil of the gun.

- 11** Making a fist with the right hand, push hard with the heel of the hand and follow through to seat the round in the chamber.

- 13** Call out, "UP."

- 14** If the air in the turret is fouled, and if there is time, turn the VENTILATOR switch to ON for a short time, and then turn it to OFF.



- 15** Keep on loading the kind of ammunition called for in the fire command (as in Steps 4 to 13), until the tank commander announces CEASE FIRE or changes the kind of ammunition to be fired.

## **Loading in response to a fire command (with no ammunition in the gun).**

- 1** Select from the ready-rack the kind of ammunition called for in the fire command (identifying it by markings).

- 2** Pull out the knob on the ready-rack holder.

- 3** Pull the nose of the round forward.

- 4** Cup one hand over the primer.

- 5** Lift the round and push it (nose first) into the breech.

- 6** Making a fist with the right hand, push hard with the heel of the hand and follow through to seat the round in the chamber.

- 7** Make sure that no crewman has any part of his body in the path of recoil of the gun.

**8** Flip the safety lever back (so that the word **SAFE** does not show).

**9** Call out, "UP."

**10** Select another round of the same kind of ammunition (as in Steps 1 to 4).

(Safety precaution: Take great care not to place any part of the body in the path of the recoil of the gun.)

**12** After the gun is fired, reload the gun, (Steps 5 to 9, omitting 8).

**14** Keep on loading the kind of ammunition called for in the fire command until the tank commander announces **CEASE FIRE**, or changes the kind of ammunition to be fired.

**11** If the gun has not yet been fired, sit in the loader's seat and hold the round.

**13** If the air in the turret is fouled, and if there is time, turn the **VENTILATOR** switch to **ON** for a short time.

## Loading a round that is difficult to seat.

**1** If the round does not seat in the chamber (if the breech does not come up),

(a) Tell the tank commander,

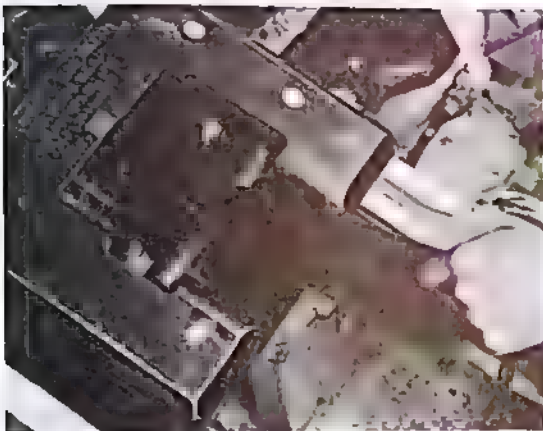
(b) Make sure the safety lever is flipped forward (so that the word **SAFE** shows),



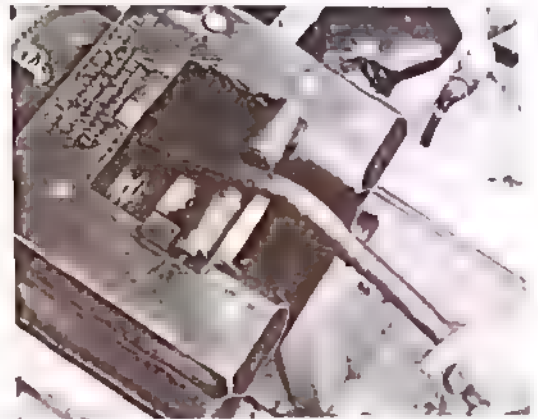
(c) Get the ramming and extracting tool from its bracket under the radios.



**2** Holding the tool by the extracting end, lower the T-bar between the grooves in the breech ring, to let the ramming heads rest on the loading notch of the breechblock.



**3** Push down on the extracting end of the tool until the round seats (until the breechblock comes up).



**4** Put the ramming and extracting tool back into its bracket.

## UNLOADING THE MAIN GUN

**Unloading an unfired round (when no attempt has been made to fire it).**

(Note: Ask the tank commander if the round may be fired.)

If the round may not be fired,

- 1** Flip the safety lever forward (so that the word **SAFE** shows).



- 3** Ask the gunner to lower the breech by operating his elevation control.

- 2** Wait at least two minutes after the last round was fired.

- 4** As another crewman pulls the operating handle down—slowly . . .



- 5** . . . pull the round back, with one hand over the primer, until the nose can be lifted up and over the breech. (Note: Do not bring the nose of the round back and around the side of the breech.)



- 6** Lower the round to the ready-rack, primer end first, with a hand cupped over the primer.



- 7** Tilt the round forward, and fit its base into the cup on the turret floor.

- 8** Straighten up the round.

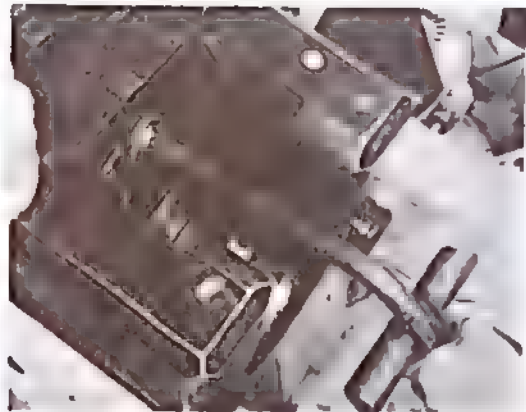
- 9** Latch the knob on the ready-rack holder.

## Unloading an unfired round which stays in the chamber after the breech is opened.

- 1** Take the ramming and extracting tool from its bracket under the radios.



- 2** Holding the tool by the ramming end, lower its two claws into the breech ring and fit them behind the rim of the cartridge.



- 3** By pushing up on the ramming end and by prying, unseat the round.



- 4** Pull the round back, with one hand over the primer, until the nose can be lifted out and over the breech.

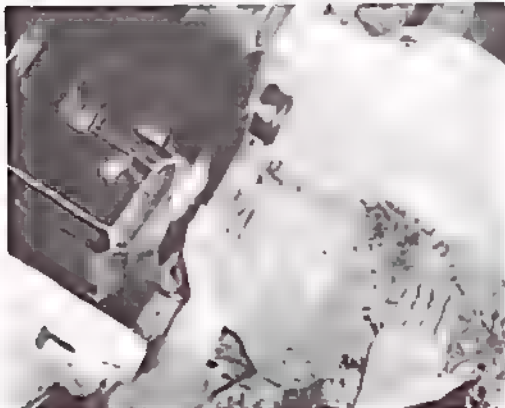


- 5** Tell the tank commander that the round is defective.

## Unloading a stuck round.

When it is not possible to unload the round using either the extractors or the ramming and extracting tool,

- 1** Be sure the breech is open; stand to the left of the breech with hands ready to catch the round when the other crewmen push it with the bell rammer.



- 2** When the round is unseated, pull it back, one hand over the primer, until the nose can be lifted out and over the breech.



- 3** Wait for the tank commander to say what to do with the round.

## Unloading a stuck projectile when the cartridge case separates from it.

- 1** Carefully, so as not to spill powder or strike the primer, hand the cartridge case to another crew member outside the turret.

(Note: Ask the tank commander what to do with the cartridge.)



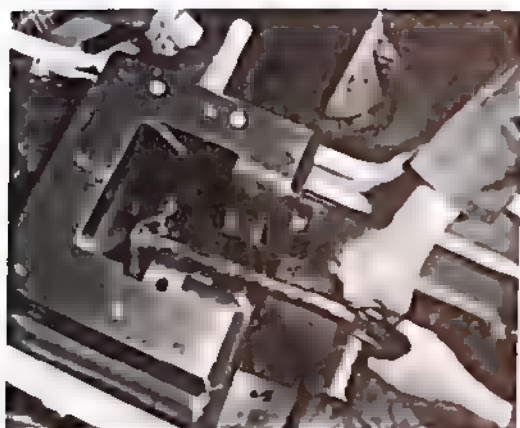


- 2** Stuff rags in the chamber to cushion the breechblock as the projectile is unseated.



- 3** Take the ramming and extracting tool from its bracket under the radios.

- 4** Trip the extractors with the claws on the extracting end of the tool, so the breech will close.

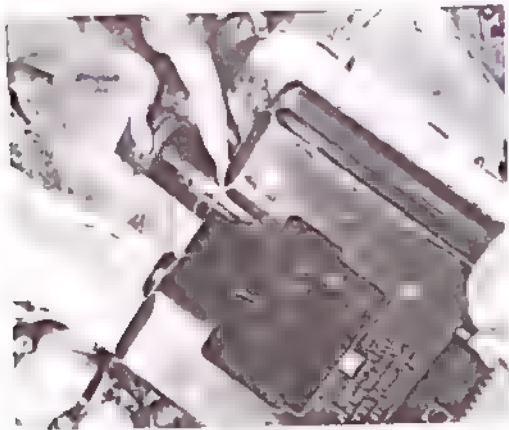


- 5** When the other crewman have unseated the projectile by pushing it with the bell rammer, pull the operating handle down to open the breech. (Note: Help may be needed in this step.)

- 6** Take out the rags.



- 7** Take out the projectile. Be careful not to drop it.



- 8** Ask the tank commander what to do with the projectile.

## Disposing of empty cartridge cases.

When several rounds have been fired, or as convenient,

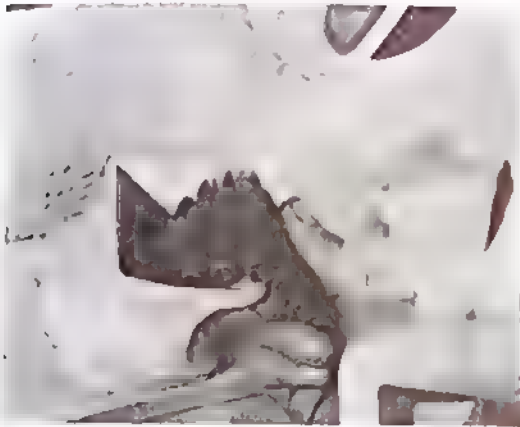
- 1** Using asbestos mittens, lift the empty cartridge cases from the turret floor.

- 2** Dispose of the empty cases as directed by the tank commander. (CAUTION: In throwing them out of the hatch, make sure not to hit anyone.)

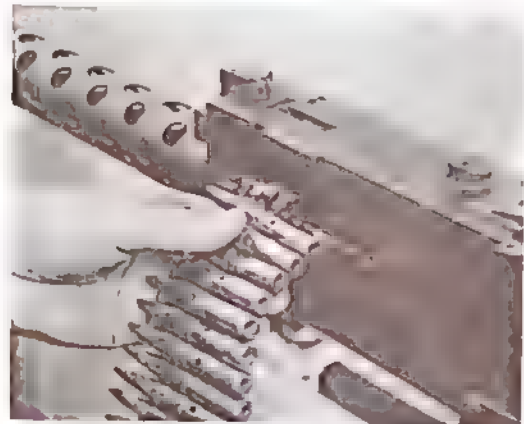
# LOADING THE COAXIAL MACHINE GUN

## Half-loading the machine gun.

- 1** Pull the end of the ammunition belt from inside the CAL .30 AMMO stowage box, through the feed chute. (Note: Make sure the belt is not kinked.)



- 2** Push the double-link end of the belt into the feedway of the machine gun until it is held in place.



- 3** Pull the belt to make sure that it is firmly in place.

- 4** Pull the retracting bar back one time and release it.

## Full-loading the machine gun.

- 1** Follow the procedure for half-loading the gun.

- 2** Pull the retracting bar back once more and release it.

# UNLOADING THE COAXIAL MACHINE GUN

- 1** Turn one of the cover latch knobs and raise the cover.



- 2** Lift up the extractor.



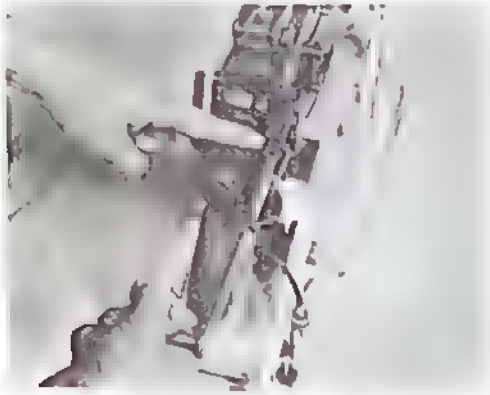
- 3** Take out the ammunition belt.



- 4** (Note: If the retracting bar is pulled back with the cover open, do not let it go forward with the cover closed, or the gun may be damaged.) Pull back the retracting bar and release it to empty the gun.



- 5** Pull the retracting bar back again. Hold it back and lock it by pushing the lock button to the right.



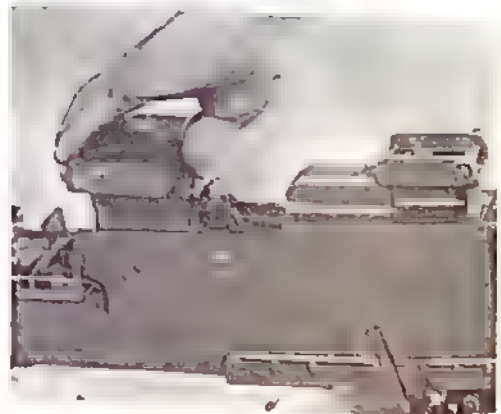
- 6** Push the manual safety to the right so that the letter "S" shows.



- 7** Feel with one finger to make sure there is no round in the chamber.



- 8** Lifting up the extractor, insert a wooden T-block into the receiver and push the T-block against the bolt so that it holds the extractor up.

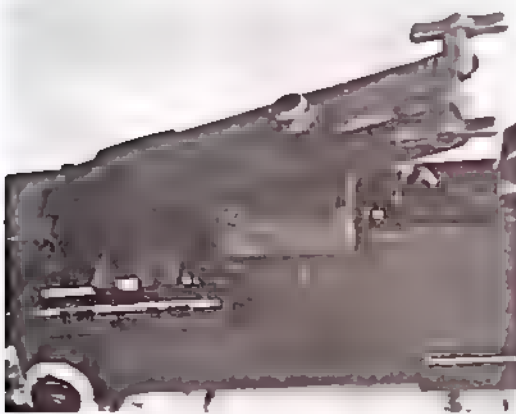




**9** Holding the retracting bar back, unlock it by pushing the lock button to the left.

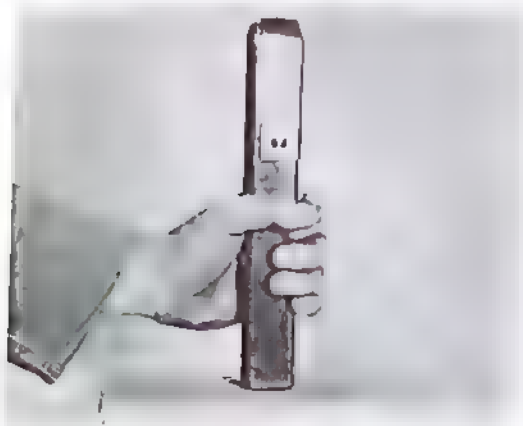
**10** Ease the retracting bar forward until the bolt rests against the T-block.

**11** Lower the cover onto the T-block.



# LOADING THE MAGAZINE OF THE SUBMACHINE GUN

- 1** Stand the magazine up, the bottom (closed end) resting on something solid (like a board).



- 2** With the loop of the stock toward the narrow end of the magazine, point the small hook on the stock down, and place the hook on the follower (the spring-loaded metal floor inside the magazine).



- 3** Using the small hook as a tool, push down the follower . . .



. . . push one round, flat end first, into the magazine until it touches the hook . . .



... lift up the hook, and push the round all the way in.

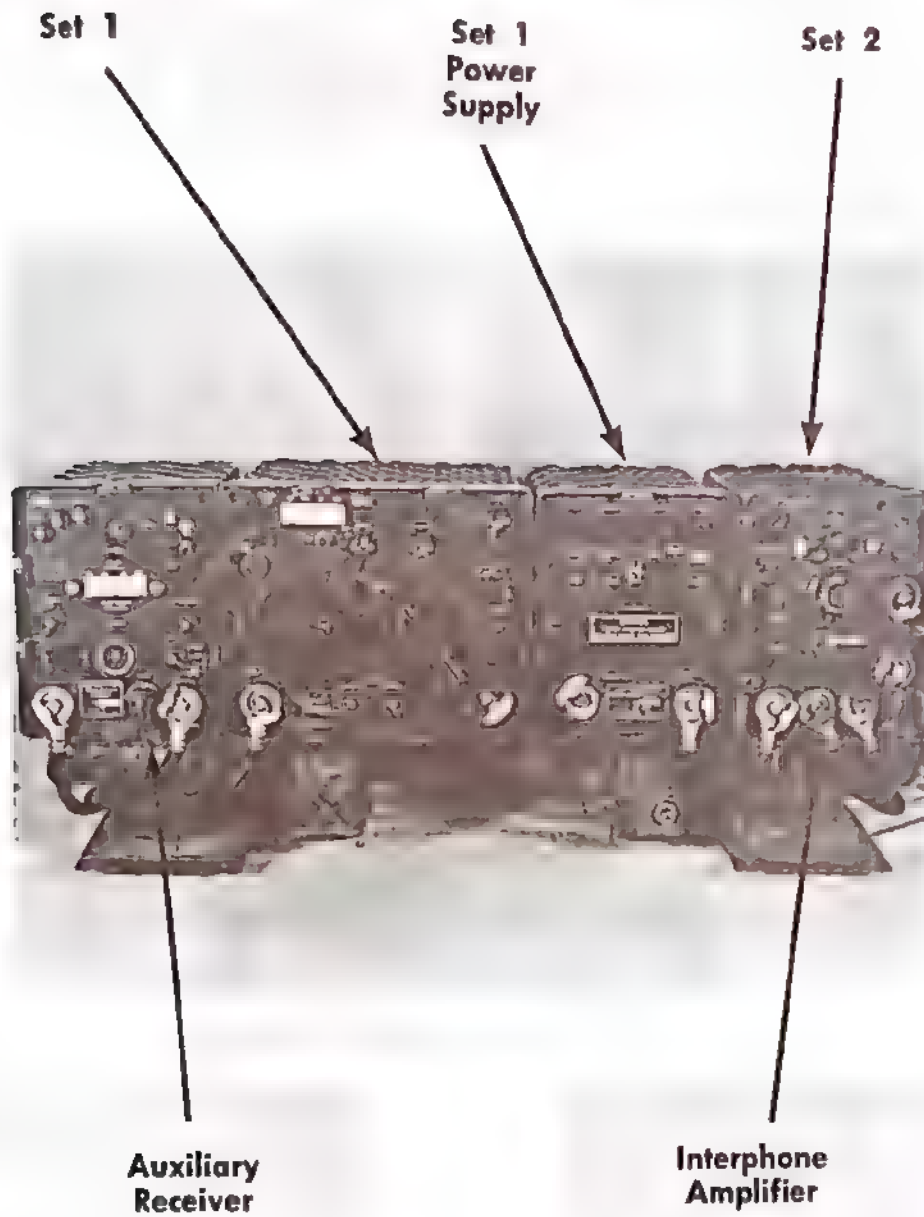


**4** Use the hook to push down on the round in the magazine, and push another round in.



**5** Continue to load rounds in the same way until the magazine will hold no more rounds. (Note: The magazine holds 30 rounds.)

# THE TANK RADIOS



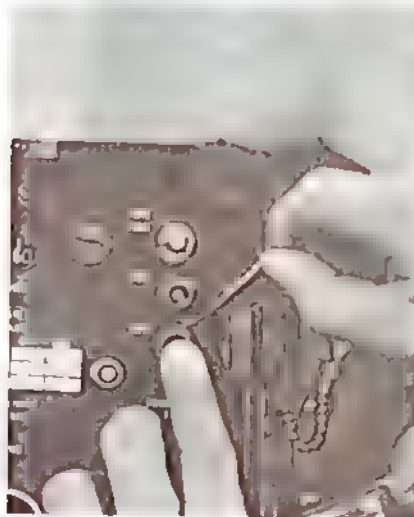
# REMOVING AND INSTALLING THE TANK RADIO

## Removing the auxiliary receiver.

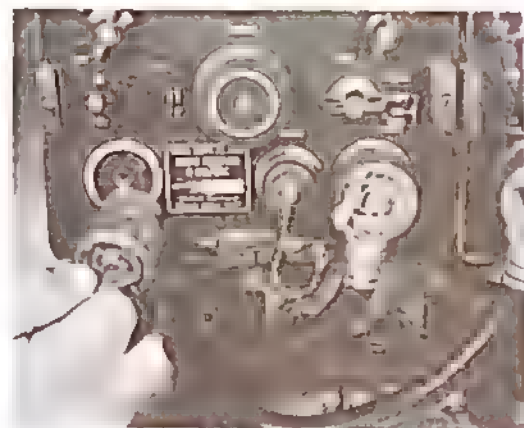
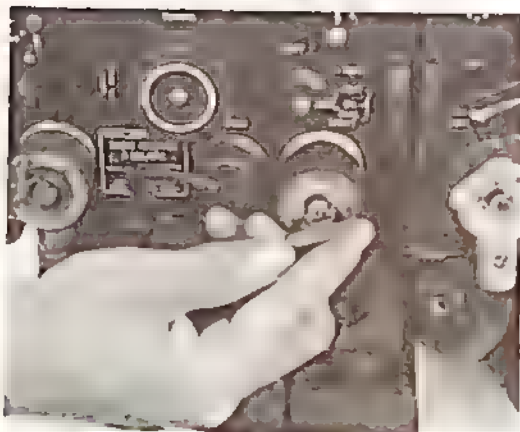
- 1** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

- 2** Disconnect the jumper wire connecting the lower ANT binding post on the auxiliary receiver with the AUX REC ANT binding post on Set 1.

(Note: Leave the jumper wire attached to the ANT binding post on the AUX REC, so that it will not be lost.)



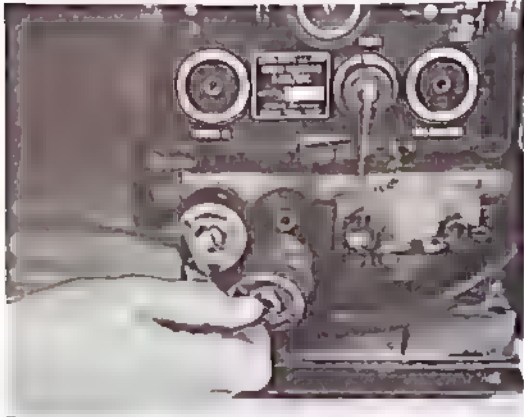
- 3** Disconnect the REC CONTROL and POWER IN cables from the receiver by turning the little handles to unscrew them.



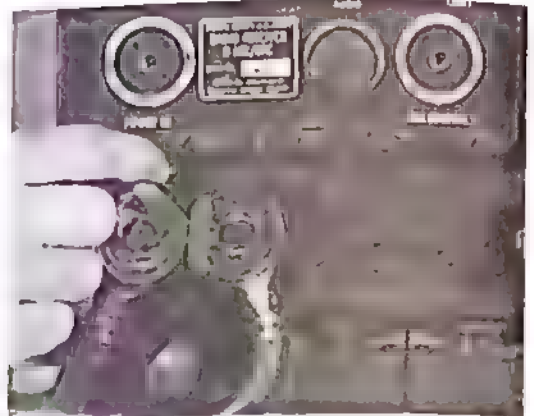


**4** Screw the REC CONTROL and POWER IN cables into their places on the radio mount.

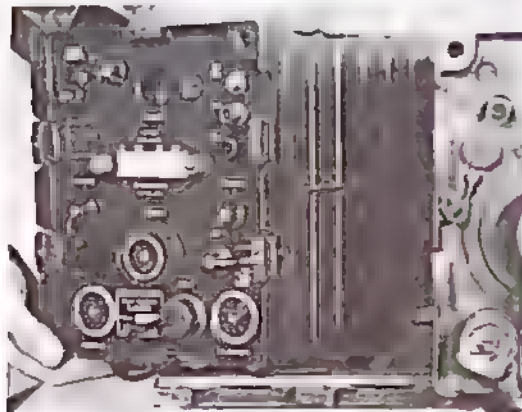
(Note: In order not to damage the connector, screw it in until it is snug, but not tight.)



**5** Unlock the receiver from the mount by flipping to the left the two locking levers underneath it.



**6** Lift the receiver from the mount.



## Removing Set 1.

- 1 Take off the recoil guard (in front of the radios).



- 3 Turn the metal band on the antenna lead-wire to the left and pull it from the ANT post.

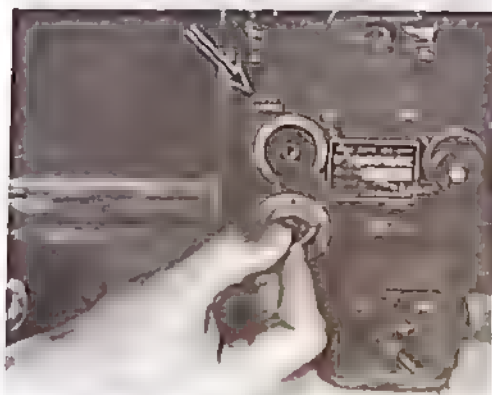


- 2 Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

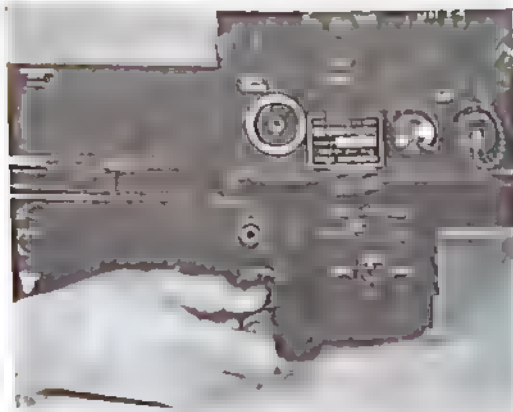


- 4 Disconnect the REC-TR CONTROL cable from the set by turning the little handle to unscrew it.

(Note: On the tank radios, the words on the cable connectors correspond to the words on the face of the set.)



- 5** Screw the REC-TR CONTROL cable into its place on the mount (to the left of the OFF-REMOTE-ON switch). (Note: Early models do not have this feature.) (Note: In order not to damage the connector, screw it in until it is snug, but not tight.)

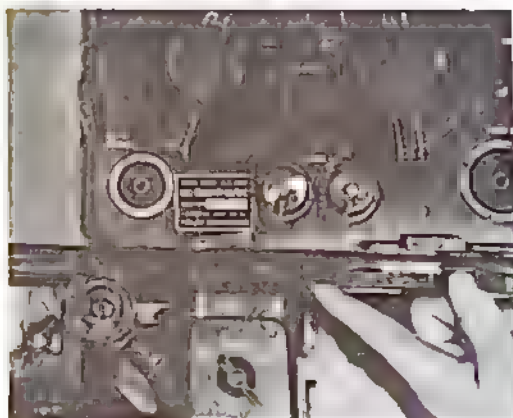


- 6** Unscrew the cable from the POWER IN plug-in of Set 1 and the POWER OUT plug-in of the power supply.

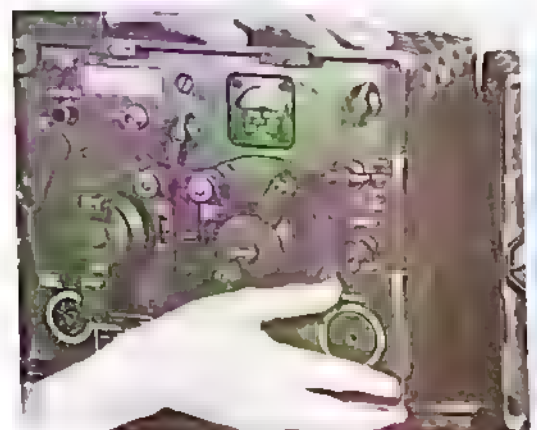
(Note: Unscrew the handles of the "dumbbell" cable evenly. If the handles are not unscrewed evenly, the set may be damaged.)



- 7** Unlock the set from the mount by flipping to the left the three locking levers underneath it.



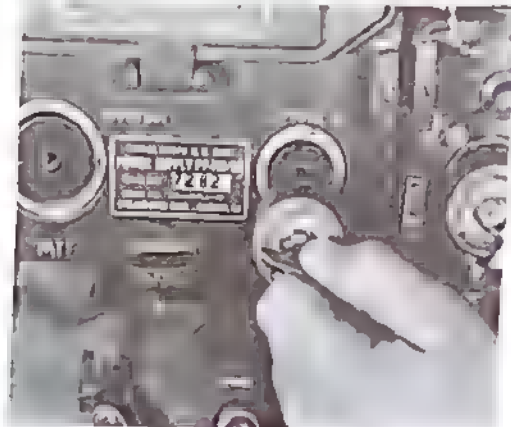
- 8** Lift the set from the mount.



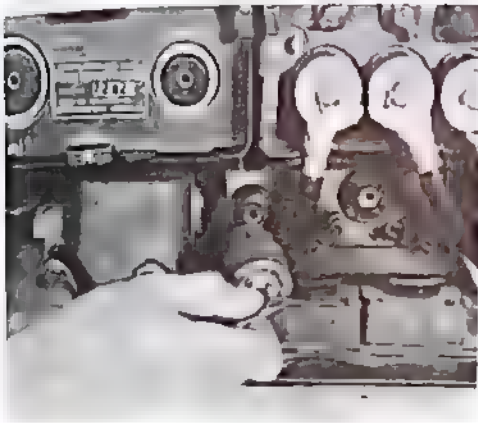
## Removing the Set 1 power supply.

**1** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

**2** Unscrew the POWER IN cable from the power supply.

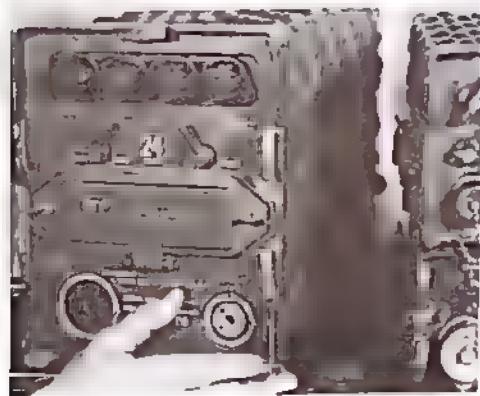


**3** Screw the POWER IN cable into its place on the mount.



**4** Unlock the power supply from the mount by flipping to the left the two locking levers underneath it.

**5** Lift the power supply from the mount.





## Removing Set 2.

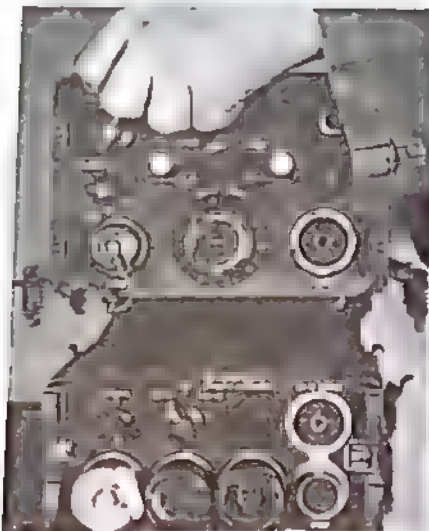
**1** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

**3** Unscrew the RT-70 POWER and POWER cable from its plug-ins on the set and on the interphone amplifier.

(CAUTION: Be sure to unscrew the two handles evenly.)



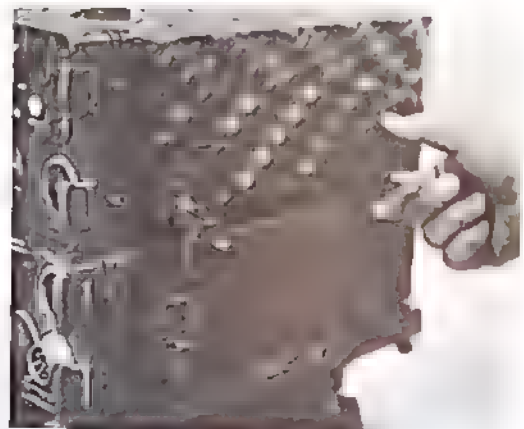
**5** Lift the set from the interphone amplifier.



**2** Turn the metal band on the Set 2 antenna lead-wire to the left and pull it from the ANT post.



**4** Unsnap the four snap catches that hold the set to the interphone amplifier.



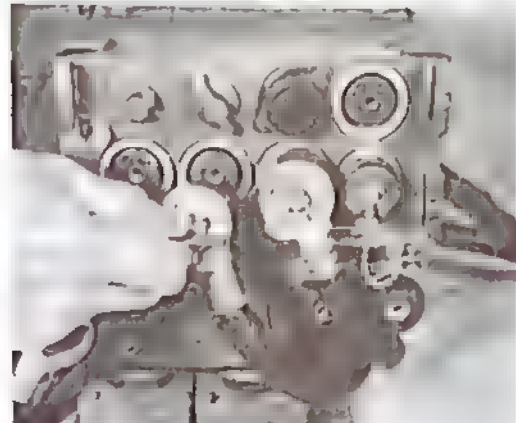


## Removing the interphone amplifier.

- 1 Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

- 2 Unscrew the POWER IN, INT CONT, and REC-TR-CONT cables from the amplifier.

- 3 Screw the POWER IN, INT CONT, and REC-TR-CONT cables into the radio mount.



- 4 Unlock the amplifier from the mount by flipping to the left the two locking levers underneath it.

- 5 Lift the amplifier from the mount.

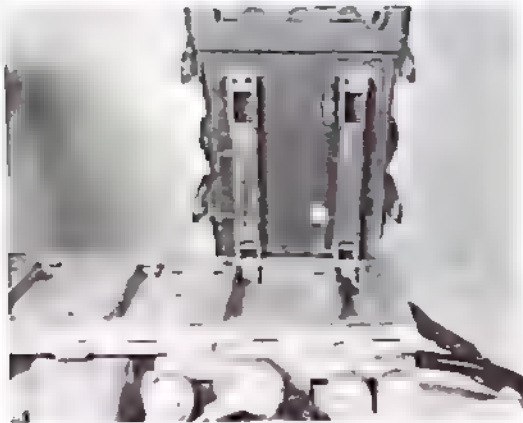


## Installing the interphone amplifier.

**1** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

**2** Make sure that the two locking levers (under the place where the amplifier goes on the mount) are in the unlocked position (flipped to the left).

**3** Place the amplifier in its position on the right end of the mount, so that its bottom ridges fit into the channels in the mount.



**4** Lock the amplifier to the mount by flipping the two locking levers to the right.

**5** Unscrew the POWER IN, INT CONT, and REC-TR-CONT cables from the mount.

**6** Screw the POWER IN, INT CONT, and REC-TR-CONT cables to the amplifier.

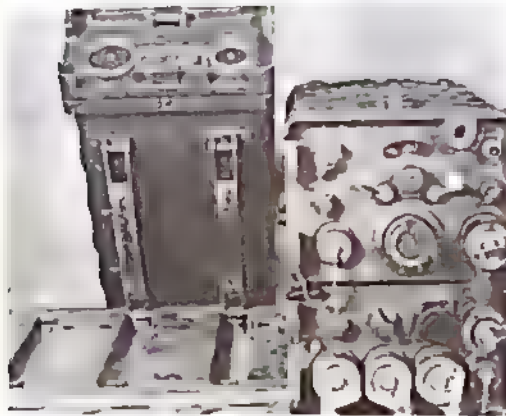
(Note: In order not to damage the plug-ins or connectors, screw them in until they are snug, but not tight.)

## Installing the Set 1 power supply.

**1** Make sure that the OFF-RE-MOTE-ON switch on the mount is in the OFF position.

**2** Be sure the locking levers (under the power supply location on the mount) are flipped to the left (unlocked).

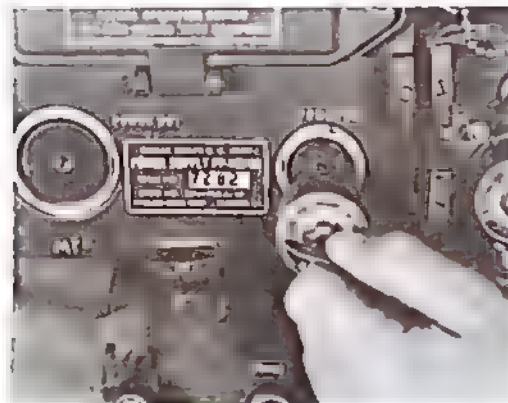
**3** Install the power supply (to the left of Set 2) so that the bottom ridges fit into the channels in the mount.



**4** Lock the power supply to the mount by flipping the two locking levers to the right.

**5** Unscrew the POWER IN cable from the mount.

**6** Screw the POWER IN cable to the power supply POWER IN plug-in.  
(Note: Screw it in until it is snug, but not tight.)

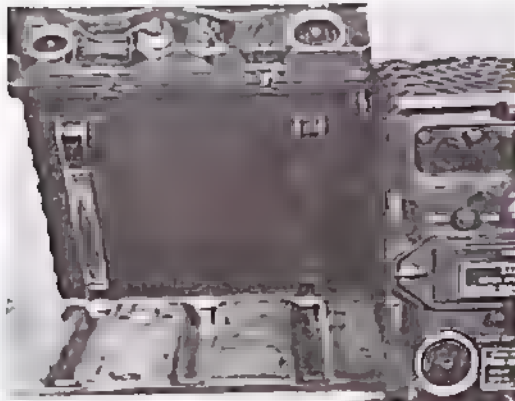


## Installing Set 1.

**1** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

**2** Make sure that the three locking levers (under the place where Set 1 goes on the mount) are in the unlocked position (flipped to the left).

**3** Place the set in its position (to the left of the power supply) on the mount, so that its bottom ridges fit into the channels in the mount.



**4** Lock the set to the mount by flipping the three locking levers to the right.

**5** Fit the antenna lead-wire into the ANT plug-in, and turn the metal band to the right to lock it in place.



**6** Screw the POWER IN and POWER OUT cable to its plug-ins on the set and the power supply.

(Note: The two ends of the cable may be plugged to either of the plug-ins. Screw them in until they are snug, but not tight.)

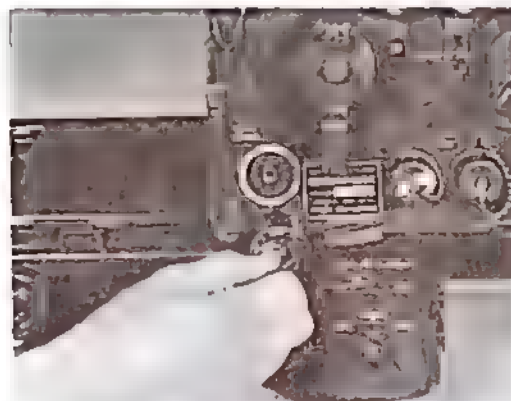


**7** Unscrew the REC-TR CONTROL cable from the mount.

**8** Screw the REC-TR CONTROL cable to the set.

(Note: Screw it in until it is snug, but not tight.)

**9** Replace the recoil guard.





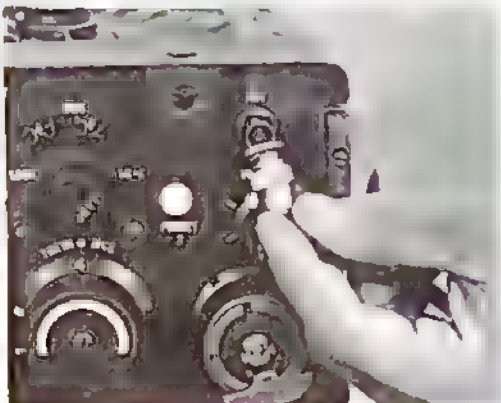
## Installing Set 2.

- 1** Make sure that the OFF-RE-MOTE-ON switch on the mount is in the OFF position.

- 3** Snap the four snap catches that hold the set to the interphone amplifier.



- 5** Fit the Set 2 antenna lead-wire onto the ANT plug-in on the set, and turn the metal band to the right to lock it in place.



- 2** Place Set 2 in its position on top of the interphone amplifier.



- 4** Screw the RT-70 POWER and POWER cable to its plug-ins on the set and on the interphone amplifier.

(Note: The two ends of the cable may be plugged into either of the plug-ins. Screw them in evenly until they are snug, but not tight. If the handles are not screwed in evenly, the set may be damaged.)



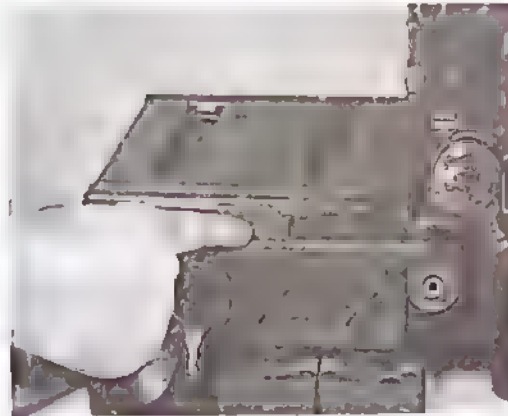
# INSTALLING THE AUXILIARY RECEIVER

**1** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

**3** Place the receiver on the left end of the mount, so that its bottom ridges fit into the channels in the mount.

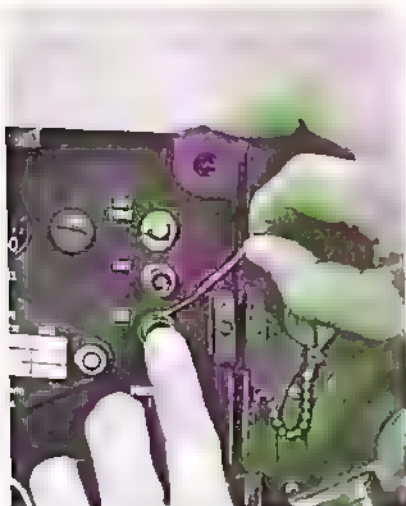


**2** Make sure that the two locking levers (under the place where the auxiliary receiver goes on the mount) are in the unlocked position (flipped to the left).



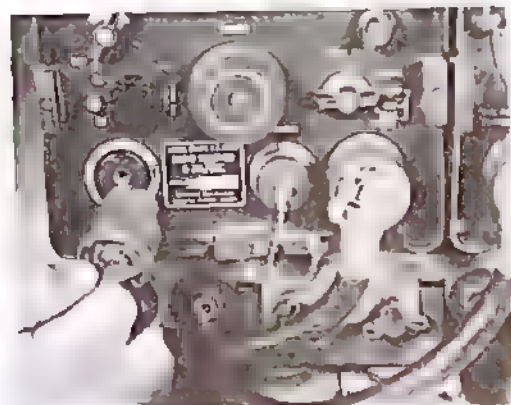
**4** Lock the receiver to the mount by flipping the two locking levers to the right.

**5** Connect the jumper wire from the AUX REC ANT binding post on Set 1 to the lower ANT binding post on the receiver.



**6** Connect the POWER IN and REC CONTROL cables to the receiver by turning the little handles to screw them in.

(Note: In order not to damage the plug-ins or connectors, screw them in until they are snug, but not tight.)



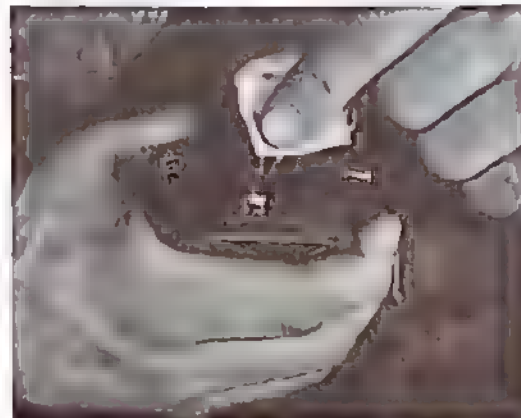
# MAINTAINING, INSTALLING, AND OPERATING THE HEAD SET-MICROPHONE CHEST SET AND TANK HELMET

## Maintaining the head set and chest set.

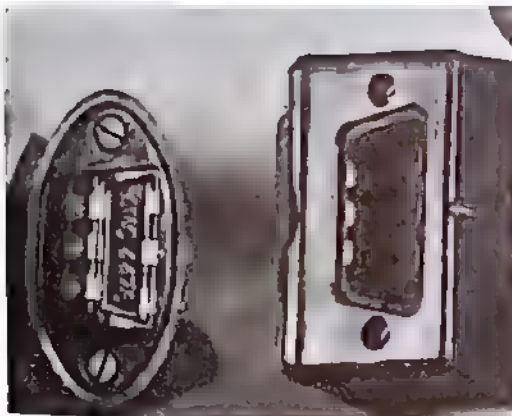
**1** Clean all dirt and grease from the equipment with clean, dry, lint-free rags. (Note: Gasoline, grease, and other petroleum products will rot rubber. Water will put the lip microphone out of commission.)



**2** Using clean, dry, lint-free rags and crocus cloth, gently rub corrosion from the connection-pins on the top of the chest set . . .



**3** . . . and the metal surfaces of the breakaway plug and the recess in the bottom of the chest set.

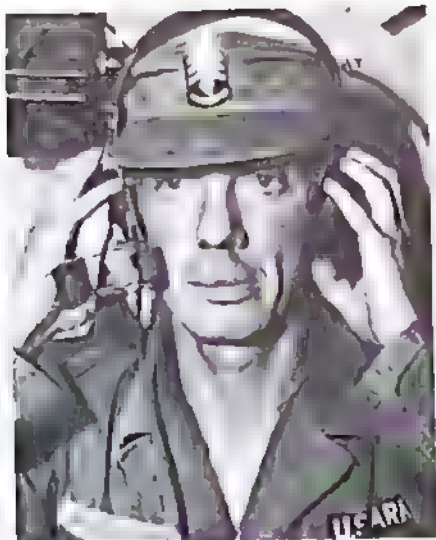


**4** Examine the cords for cuts, kinks, and fraying. Report any damage to the tank commander.



# Installing and operating the head set and chest set.

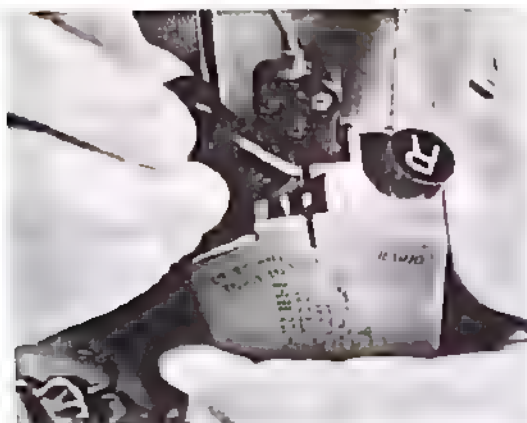
- 1** Put on the head set and adjust the earpieces by pulling and pushing them so that they fit well over the ears.



- 2** By loosening and tightening the lock screw on the right side of the head set, adjust the lip microphone until it rests about half an inch from the lips.



- 3** Fit the two head set plugs over the connection-pins and into the top of the chest set.



- 4** Push the breakaway plug up into the bottom of the chest set. (Note: The plug is not square. Be sure to fit it to the hole before trying to push it in.)





- 5** plug the audio-connector into one side of the control box on the turret wall.



- 6** Turn the selector switch on the control box to the center position.



- 7** Ask the driver to turn on his MASTER switch.

- 8** Turn the OFF - REMOTE - ON switch to ON.



- 9** Turn the OFF-INT-RT70 switch on the interphone amplifier to the INT position.





- 10** Adjust the volume by turning the knob on the same side the breakaway cord is plugged in.



- 11** Press the INTERPHONE button on the chest set and try to talk to another crewman whose head set is installed and in working order. If the other crewman fails to hear the message, or if his reply cannot be heard, notify the tank commander that the head and chest set do not work.



(Note: To talk and listen without holding the interphone button, press and turn the interphone button to lock it.)

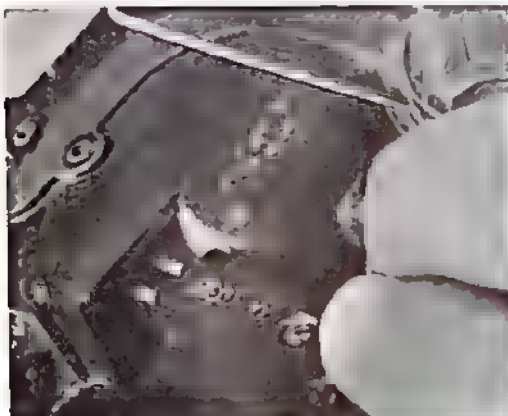


## Maintaining the tank helmet.

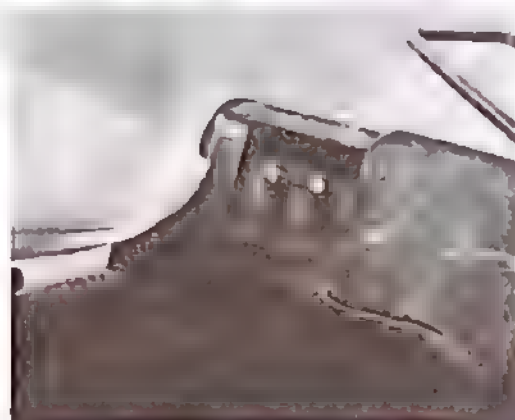
- 1** Clean all dirt and grease from the equipment with clean, dry, lint-free rags. (Note: Gasoline, grease, and other petroleum products will rot rubber. Water will put the lip microphone out of commission.)



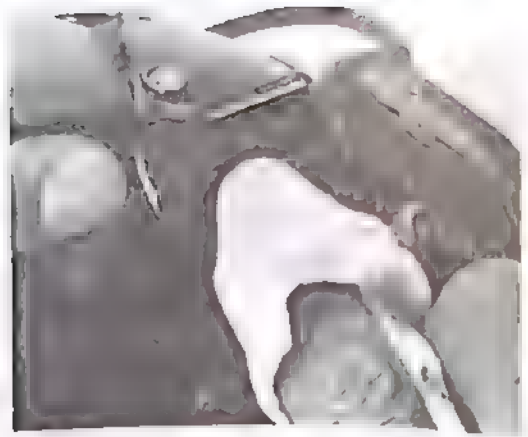
- 2** (a) Pull out the earphone plug.



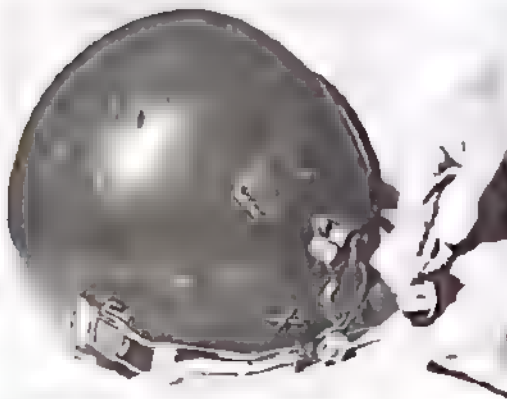
- (b)** Clean the connecting pins of the plug socket . . .



(c) . . . the plug itself . . .



(d) . . . and the outer and inner metal surfaces of the breakaway plug; use clean rags and gently rub corrosion from connecting pins with crocus cloth.



**3** Examine the cords for cuts, kinks, and fraying. Report any damage to the tank commander.



# Installing and operating the tank helmet.

**1** Put on the tank helmet.



**2** (a) If the helmet feels too large (or too small), unfasten the snap . . .



(b) . . . and adjust the size using the headband adjusting strap, until the helmet fits comfortably.



**3** If the earphones are too tight or do not fit well over the ears, adjust them by inserting or removing rubber pads.



- 4** (a) Press the spring-loaded clip to remove it from the edge of the helmet . . .



- (b) . . . and attach it to an outer piece of clothing.



- 5** (a) By loosening the lock screw on the helmet . . .



- (b) . . . adjust the lip microphone until it rests about half an inch from the lips, and tighten the lock screw.

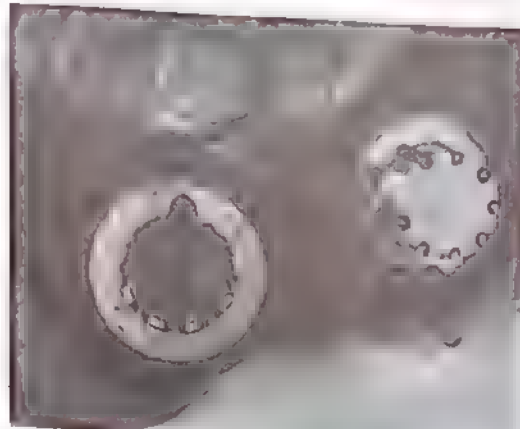




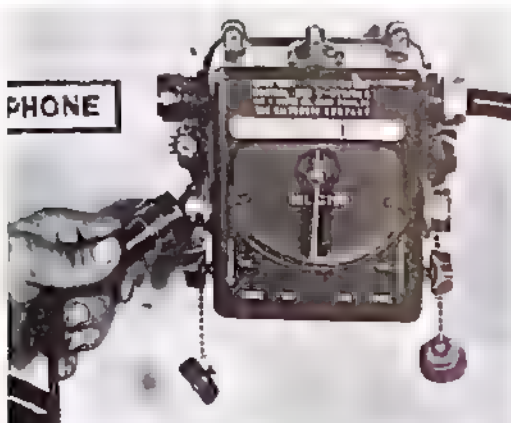
- 6** (a) Fit the helmet breakaway plug into the socket of the extension cord . . .



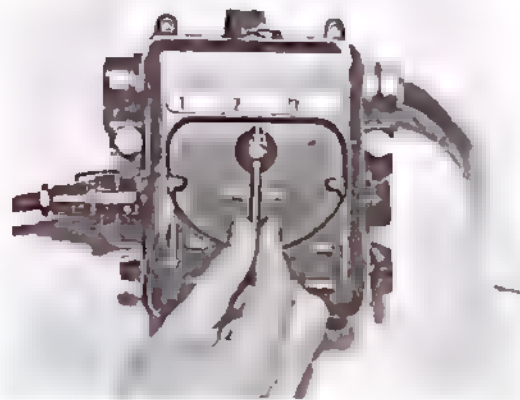
- (b) . . . so that the raised tongue of the plug matches the groove in the socket on the extension cord.



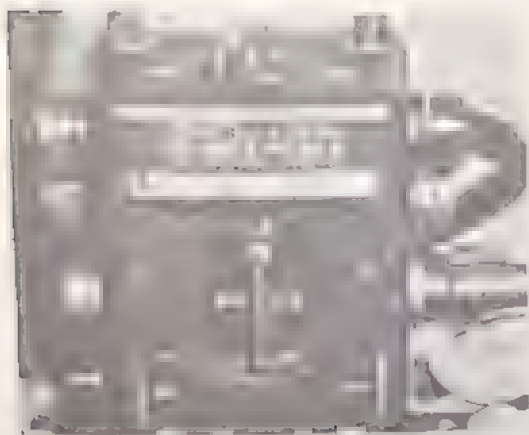
- 7** Plug the audio connector into the side of the control box.



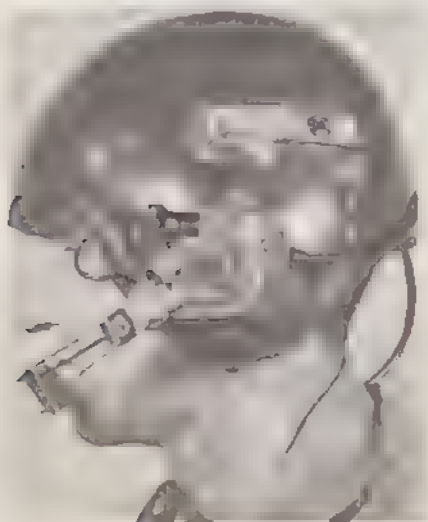
- 8** Turn the selector switch on the control box to the center position.



- 9** Adjust the volume by turning the switch under the audio connector plug-in.



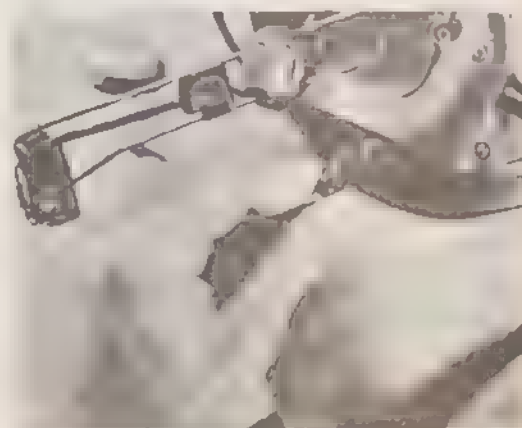
(Note: To listen to the tank radios, flip the toggle switch to the center . . .



- 10** Flip the toggle switch to the rear position and try to talk to another crewman whose helmet is installed and is in working order. If the other crewman does not hear, or if his reply is not heard, notify the tank commander that the helmet interphone does not work.



. . . and to talk over the radios, hold the toggle switch to the front.)



# CHECKING THE OPERATION OF THE RADIO MOUNT

(Note: Make sure the driver's MASTER switch is turned on.)

- 1 Turn the OFF-REMOTE-ON switch to the ON position.



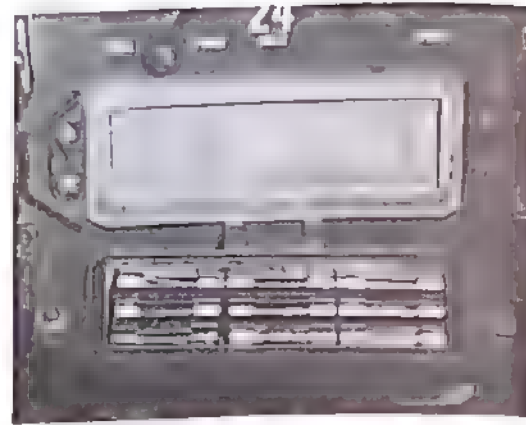
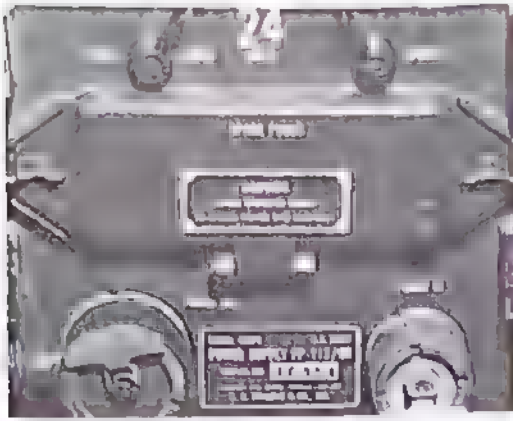
- 2 As the switch is turned from REMOTE to ON, listen for the click of the mount relay and see if the POWER lamp light goes on. (Note: Make sure that the POWER lamp dimmer control is turned all the way in the direction of the BRIGHT arrow.)



- 3 (CAUTION: Before changing a fuse, make sure that the OFF-REMOTE-ON switch is turned to OFF.) If the relay click is not heard and the lamp does not light, unscrew the fuse holder around the corner from the OFF-REMOTE-ON switch, and replace the fuse if it is burned out. (Note: Make sure that the new fuse has the number 2 on one of its metal ends.)



(Note: Spare fuses for the radio mount are kept here.)



**4** If the relay click is still not heard and the lamp still does not light, tell the tank commander that the mount is out of order.

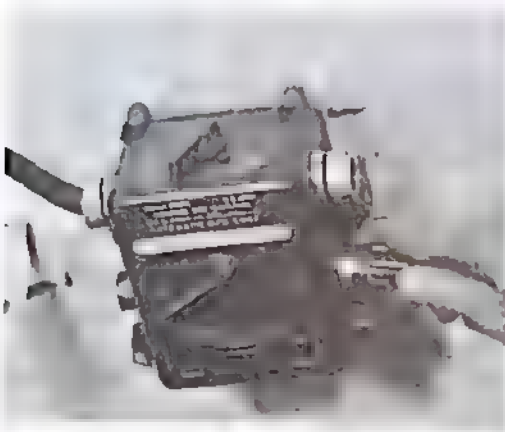
**5** If the relay clicks but the lamp does not light, tell the tank commander that the POWER lamp is burned out.

# PUTTING THE INTERPHONE AMPLIFIER, SET 1, AND SET 2 INTO OPERATION

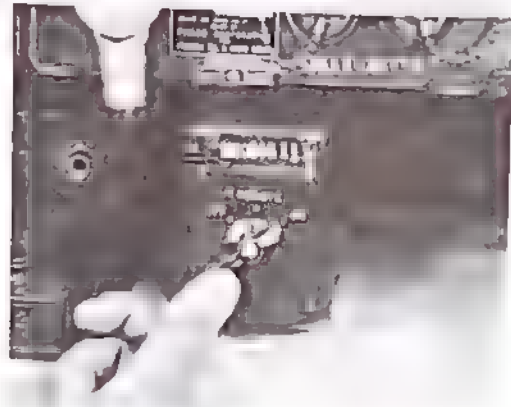
(Note: Make sure the driver's MASTER switch is turned on.)

## Putting the interphone amplifier into operation.

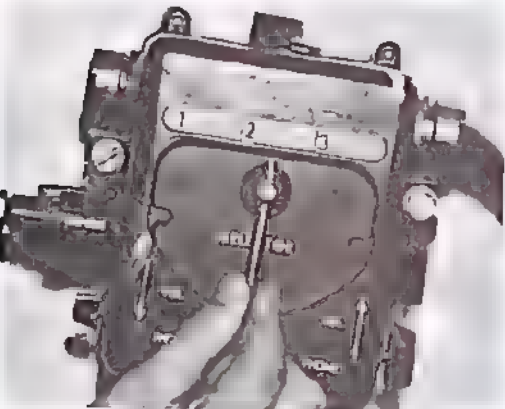
**1** Plug a head and chest set (or a hand set) into one of the audio connectors on the control box (on the turret wall).



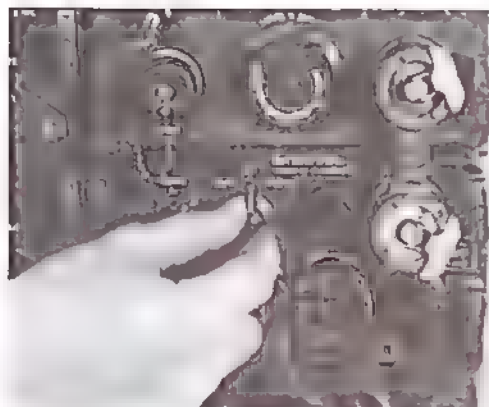
**2** Turn the mount OFF-REMOTE-ON switch to ON.



**3** Turn the selector switch on the control box to the center position.

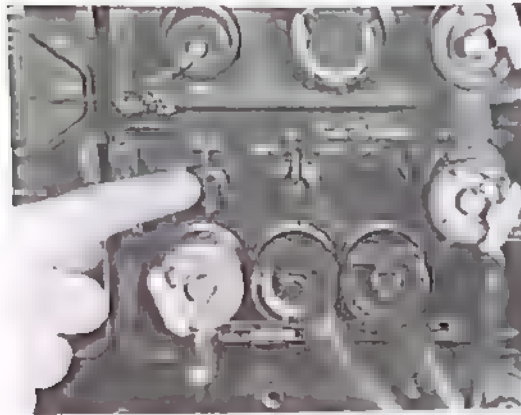


**4** If radio silence is being kept, turn the OFF-INT-RT70 switch on the interphone amplifier to the INT position.





- 5** Screw the VOLUME knob on the interphone amplifier (turn it clockwise) as far as it will go.



- 6** If the control box (on the turret wall) is being used, turn the volume knob, on the side where the chest set (or hand set) is plugged in, to the desired loudness.



## Putting Set 2 into operation.

- 1** Before putting Set 2 into operation,

(a) Make sure that the antenna on the set is screwed into its base near the loader's hatch.



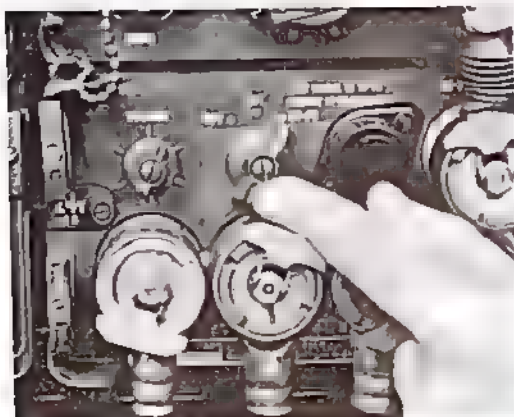
(b) Make sure that the Set 2 antenna lead wire is connected to the turret plug-in (on the loader's side) and to the ANT plug-in on Set 2.



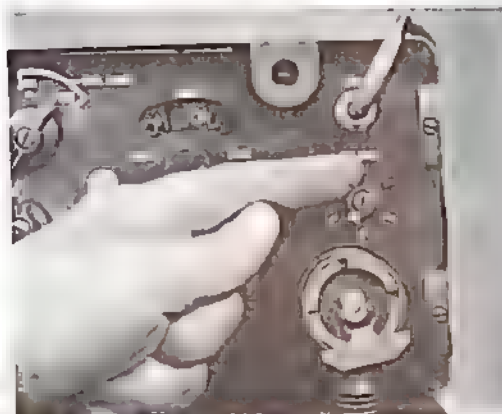
(c) Make sure that all the cable connectors of the set are correctly connected. (Note: The words on the connectors must correspond with the words on the face of the set. The connectors should be screwed in snug, but not tight.)

**2** Before calibrating Set 2, make sure that the mount OFF-REMOTE-ON switch is turned to ON.

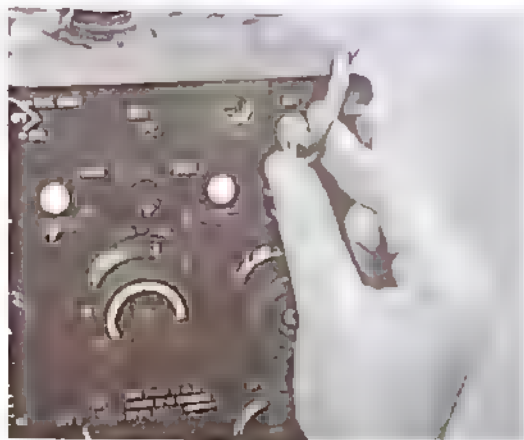
**3** Turn the OFF-INT-RT70 switch on the interphone amplifier (under Set 2) to the RT70 position.



**4** Turn the VOLUME knob on Set 2 (turn it clockwise) as far as it will go.



(b) Make sure that the Set 2 antenna lead wire is connected to the turret plug-in (on the loader's side) and to the ANT plug-in on Set 2.

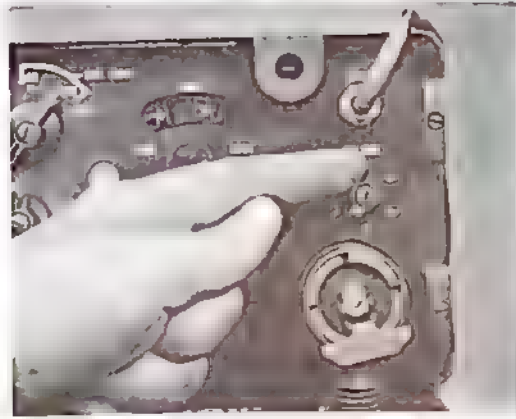
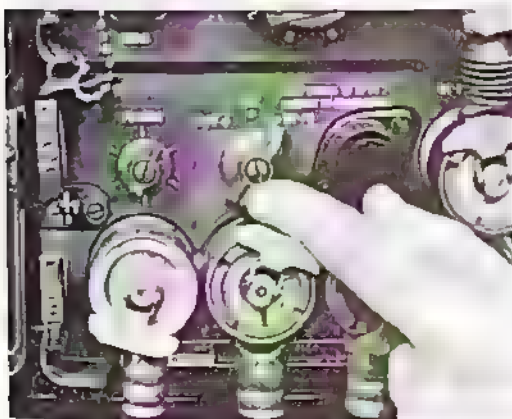


(c) Make sure that all the cable connectors of the set are correctly connected. (Note: The words on the connectors must correspond with the words on the face of the set. The connectors should be screwed in snug, but not tight.)

**2** Before calibrating Set 2, make sure that the mount OFF-REMOTE-ON switch is turned to ON.

**3** Turn the OFF-INT-RT70 switch on the interphone amplifier (under Set 2) to the RT70 position.

**4** Turn the VOLUME knob on Set 2 (turn it clockwise) as far as it will go.



**5** Turn the SQUELCH knob to the OFF position.



**7** Zero beat.

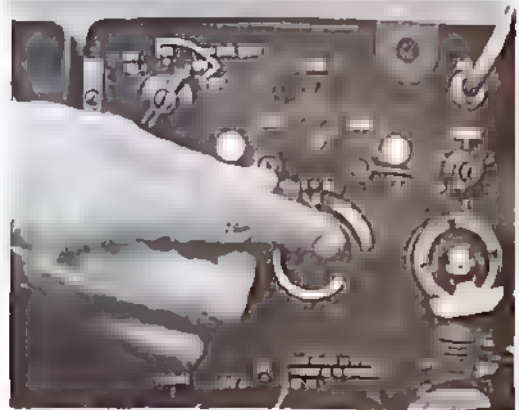
(a) Push the DIAL LIGHT knob to the CAL position and hold it there. Still holding the DIAL LIGHT knob in the CAL position,



(c) Adjust the tuning knob to the middle of the "valley" of silence.

(d) Release the DIAL LIGHT knob.

**6** (Note: Assume the operating (channel) frequency will be 52.4 Megacycles.) Turn the tuning knob on the set to indicate on the MCS dial the nearest whole number of the channel frequency to be used. (In the picture, 52.0 is the nearest whole number to 52.4, as indicated on the TENTH-MCS and MCS dials.)



(b) Turn the tuning knob slowly (usually no more than half an inch) to the right or left until two "hills" of high-pitched sound are found with a "valley" of silence between them.

Still holding the DIAL LIGHT knob in the CAL position,



(Note: If no zero beat (calibration signal) is found at the nearest numbered point on the dial, tell the tank commander that Set 2 is out of order.)



**8** Holding the tuning knob to keep it from turning, push in the outer TENTH MCS scale and turn it until 0 on the scale is directly under the white dot. (Note: Repeat Step 7 to re-check for zero beat.)



**9** Turn the tuning knob to indicate on the TENTH MCS scale the number of tenths (of megacycles) of the operating (channel) frequency to be used. (In the picture, 4-tenths megacycles.)



**10** Turn the SQUELCH knob on the set until the rushing sound ceases, and no further. If the rushing sound cannot be silenced by turning the SQUELCH knob, tell the tank commander that Set 2 is out of order.

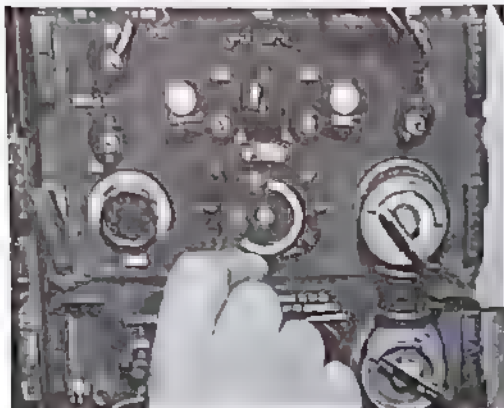


**11** Place the preset levers in the horizontal position.

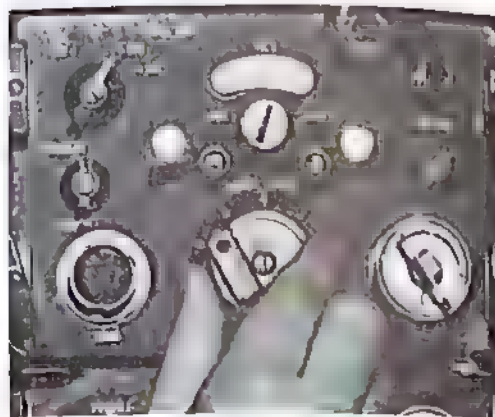




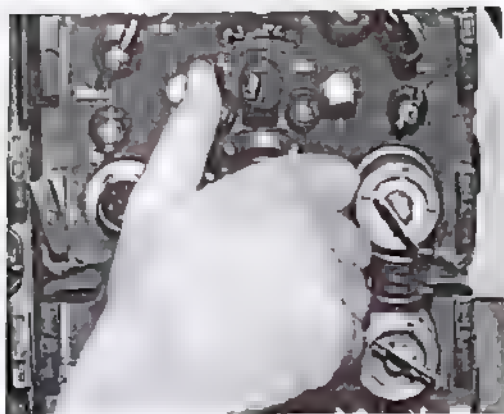
- 12** Turn the TENTH-MCS tuning knob all the way to the right, then all the way to the left.



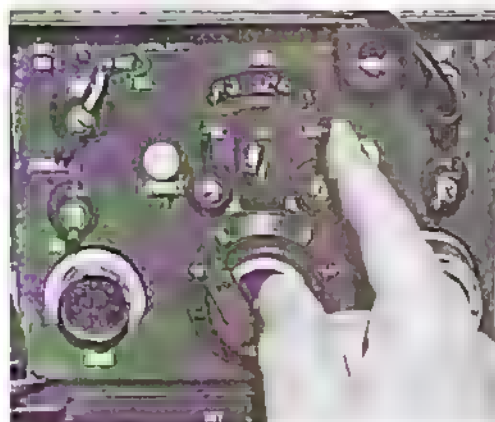
- 13** Since the set is already calibrated, turn the TENTH-MCS tuning knob to 52.4 megacycles.



- 14** Turn either one of the preset levels up to the LOCK position.



- 15** If there is a need to operate on an additional channel, (2 frequencies), perform steps 6 through 13 using the second operating frequency in the calibration procedure and then turn the other preset level up to the LOCK position.



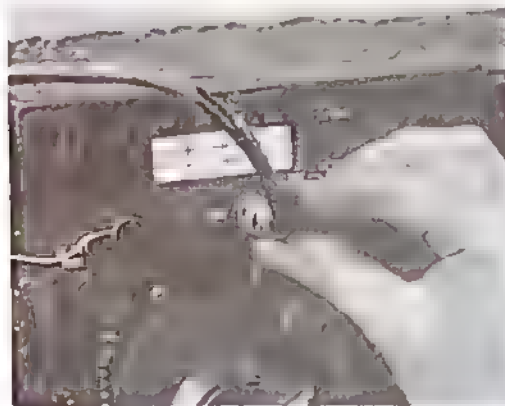
## Putting Set 1 into operation.

**1** Before putting the set into operation,

(a) Make sure that the Set 1 antenna is screwed into its base behind the tank commander's hatch.



(b) Make sure that the Set 1 antenna lead wire is connected to the turret plug-in (behind the auxiliary receiver) and to the ANT post on Set 1.

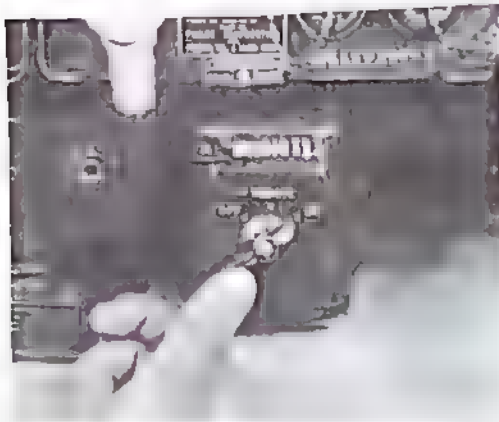


(c) Make sure that all the cable connectors of the set are connected correctly.

(Note: The words on the connectors must correspond with the words on the face of the set. The connectors should be screwed in snug, but not tight.)

(Note: If the tank has an auxiliary receiver, turn the auxiliary receiver VOLUME switch to the OFF position to make sure that no rushing sound from the auxiliary receiver can be heard while Set 1 is being put into operation.)

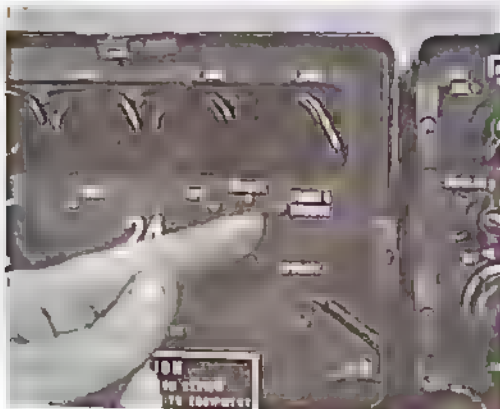
- 2** Make sure that the mount OFF-REMOTE-ON switch is turned to ON.



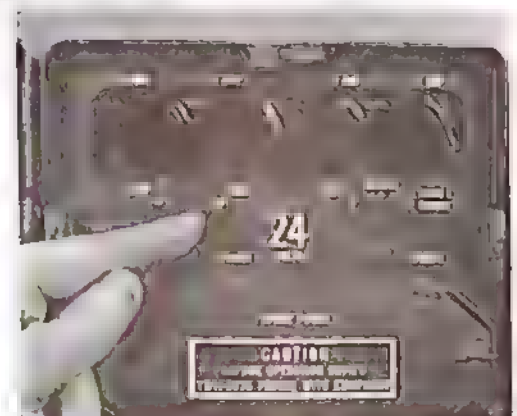
(CAUTION: If the set is being used during listening silence, turn the OPERATE switch on the Set 1 power supply to RECEIVE.)



- 3** If the set is being used for ordinary purposes, turn the OPERATE switch on the power supply to TRANS and RECEIVE.

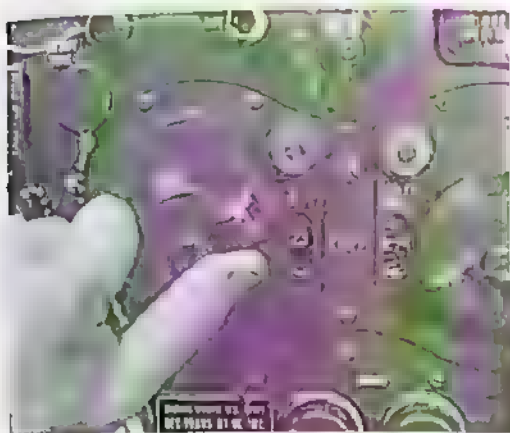


- 4** Turn the TRANS POWER switch to HIGH or LOW, as specified by the tank commander.



**5** Turn the MCS knob to indicate on the MCS dial the number of megacycles of the channel to be used. (In the picture, 23 megacycles.)

(CAUTION: Do not turn both the TENTH-MCS and the MCS knobs at the same time.)

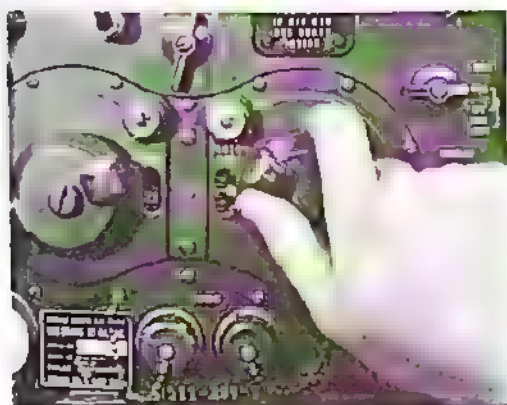


(Note: If the dial is too dim to read, turn the DIAL LIGHT switch to the ON position. If the dial light does not light, tell the tank commander that it is burned out.)

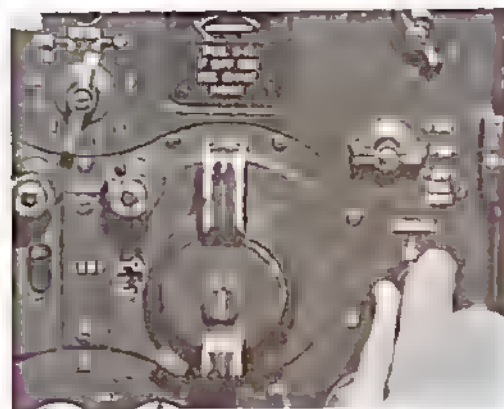


**6** Turn the TENTH-MCS knob to indicate on the TENTH-MCS dial the number of tenths (of megacycles) of the channel frequency to be used. (In the picture, 8-tenths megacycles.)

(Note: To put the TENTH-MCS knob into detent, turn the knob to the right until it clicks. To take the knob out of detent, turn the knob to the left until it clicks.)



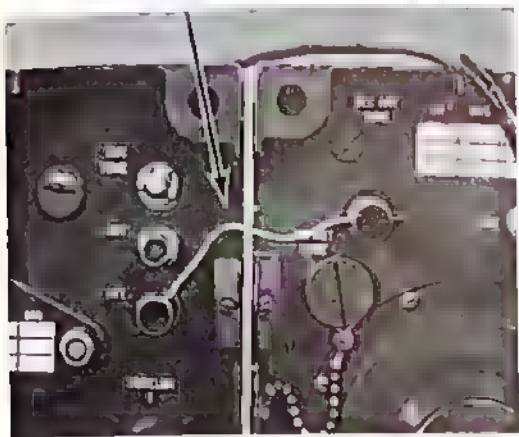
**7** Turn the SQUELCH knob on the set until the rushing sound ceases, and no further. If the rushing sound cannot be silenced by turning the SQUELCH knob, tell the tank commander that Set 1 is out of order.



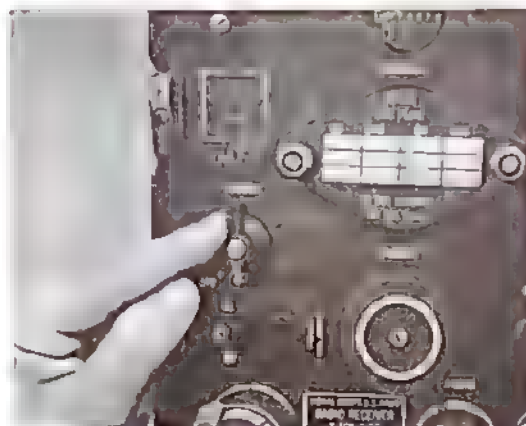


# PUTTING THE AUXILIARY RECEIVER INTO OPERATION

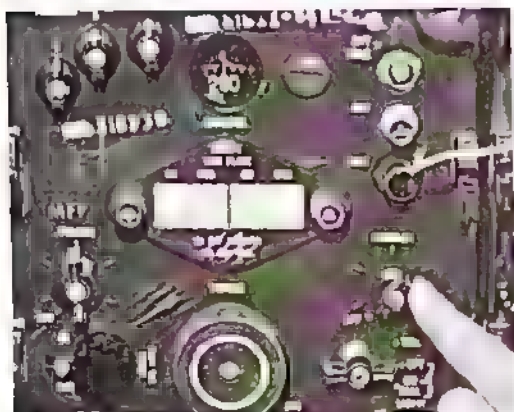
**1** Make sure that the antenna jumper wire is connected from the AUX REC ANT binding post on Set 1 to the lower ANT binding post on the auxiliary receiver.



**2** Turn the VOLUME knob on the receiver (turn it clockwise) from the OFF position as far as it will go.

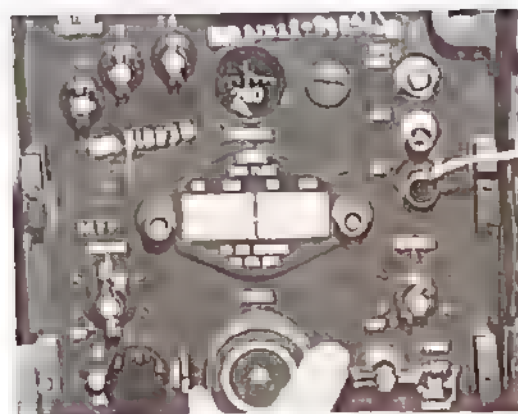


**3** Turn the SQUELCH knob off.



(Note: Assume the operating (channel) frequency will be 26.0 megacycles.)

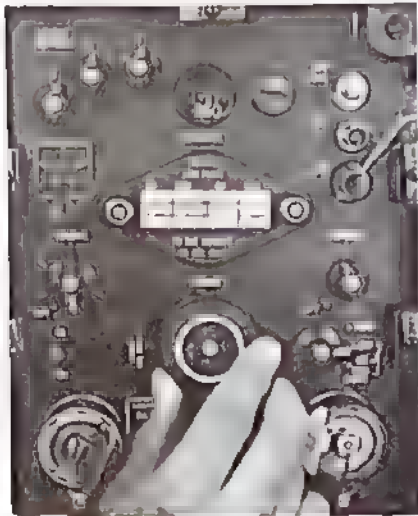
**4** Turn the TUNING knob to indicate the desired frequency on the CHANNEL dial.





**5** Calibrate.  
(Note: There are two red dots on the CHANNEL dial. One is located at 21.5; the other, at 25.8.)

(a) Turn the TUNING knob to indicate the red dot on the CHANNEL dial which is nearest to the desired operating frequency.

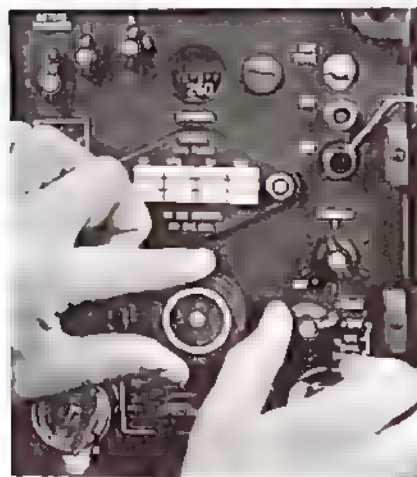


(b) Push the DIAL LIGHT switch to the TUNE position and hold it there.



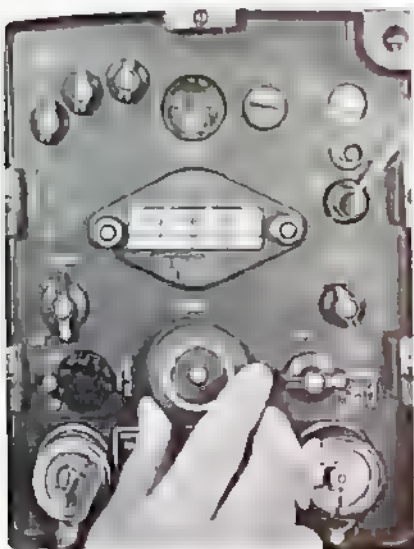
(c) Zero beat.

(1) Turn the TUNING knob slowly to the right or left until two "hills" of high-pitched sound are found with a "valley" of silence between them.



(2) Adjust the TUNING knob to the middle of the "valley" of silence.

(d) Release the DIAL LIGHT switch. The red dot should be lined up with the index line on the CHANNEL dial. If the dot is not lined up with the index line, tell the tank commander that the auxiliary receiver is not calibrated.

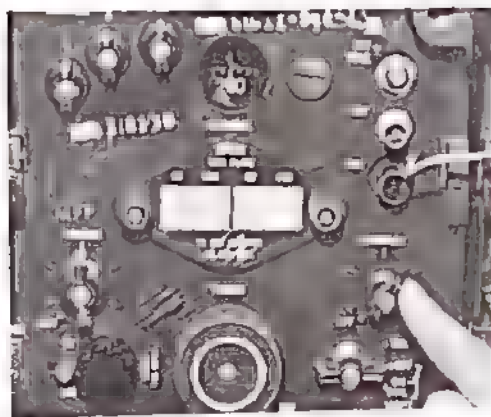


(Note: If no zero beat (calibration signal) is found at the nearest red dot on the CHANNEL dial, tell the tank commander that the auxiliary receiver is out of order.)

**6** Turn the TUNING knob to the desired channel on the CHANNEL dial. (See Step 4.)

(Note: The number on the CHANNEL dial should be read as follows: 260 should be read 26.0, 270 should be read 27.0. Each mark on the CHANNEL dial is a tenth-megacycle setting. Thus, the first mark to the right of 260 should be read 26.1.)

**7** Turn the SQUELCH knob until there is not rushing sound, and no further. If the SQUELCH knob does not stop the rushing noise, tell the tank commander that the auxiliary receiver is out of order.



# CHECKING THE OPERATION OF THE RADIO FROM THE INTERPHONE CONTROL BOX

- 1** Plug a head and chest set into one of the AUDIO plug-ins (one on each side of the control box).



- 2** Put Set 1, Set 2, and the interphone amplifier into operation.

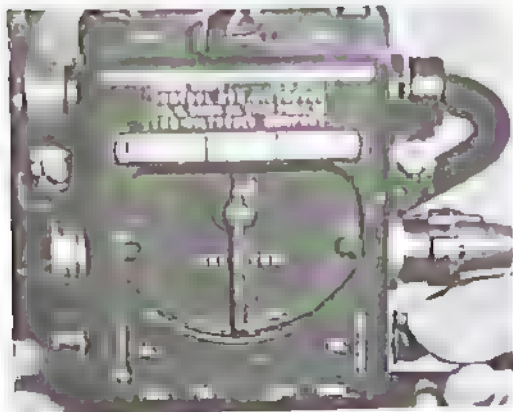
- 3** Turn the selector switch to the center position.



- 4** Press the INTERPHONE button on the chest set and talk with one of the other crewmen.



- 5** Turn the VOLUME knob under the AUDIO plug-in until the signals are loud enough.



- 7** To transmit over Set 1, make sure to hold or lock the switch on top of the control box in the RADIO TRANS position.



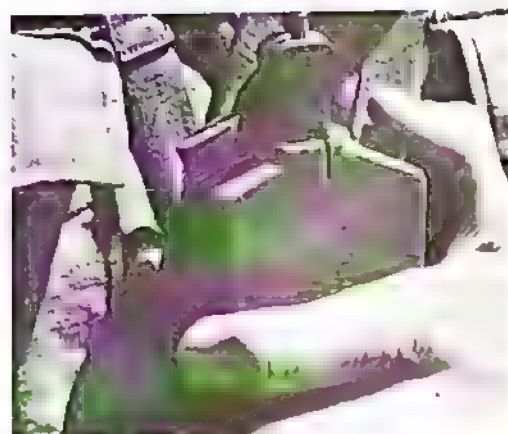
- 6** Turn the selector switch to point to the counter-clockwise position (so that the bottom of the switch points to the right).

(Note: With the selector switch in this position, radio transmissions can be heard over both Set 1 and the auxiliary receiver.)



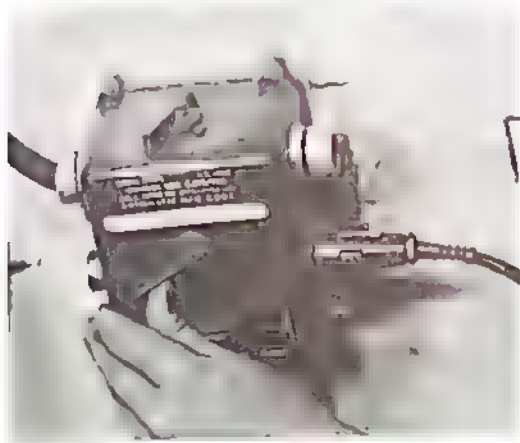
- 8** Press the RADIO button on the chest set to transmit.

(Note: For the correct procedure used in transmitting, see "Using the Tank Radios.")

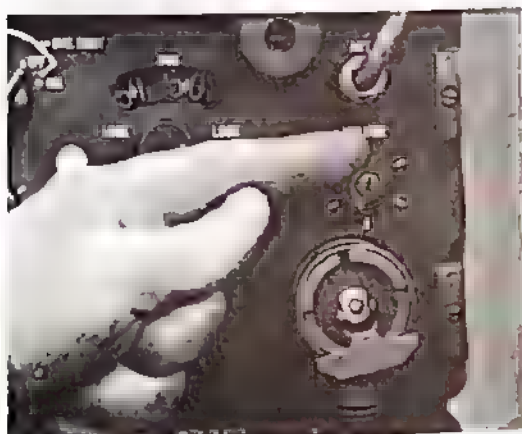


**9** Turn the selector switch to point to the clockwise position (so that the bottom part of the switch points to the left).

(Note: With the selector switch in this position, radio transmissions can be heard over Set 2.)



**13** If the signals are weak, adjust the VOLUME control knob on Set 2. (Note: The VOLUME control knob on Set 2 is turned clockwise to increase the loudness for Set 2 only.) The VOLUME knob on the interphone control box changes the loudness of the voice heard on the interphone, Set 1, Set 2, and the auxiliary receiver.)



**10** To transmit over Set 2 be sure to hold or lock the switch on top of the control box in the RADIO TRANS position.

**11** Press the RADIO button on the chest set to transmit. (Note: For the correct procedure used in transmitting, see "Using the Tank Radio.")

**12** Turn the VOLUME knob under the AUDIO plug-in until the signals are loud enough.

**14** If the operation of the tank radio through the interphone control box is not satisfactory, tell the tank commander.



# CHECKING THE OPERATION OF THE EXTERNAL INTERPHONE

## Checking the signal lights.

**1** Make sure that the driver,

(a) Turns on his MASTER switch.

(b) Turns the switch on his external interphone control box to ON. (Note: On most M48A1 tanks, the light on the front of the driver's control box does not light.)

(Note: Make sure the SIGNAL LAMP TEST switch is pushed as far as it will go toward the turret wall.)

**2** Make sure that the mount OFF-REMOTE-ON switch is turned to ON.

**3** (a) Push the PUSH TO SIGNAL switch on the turret interphone signal box . . .

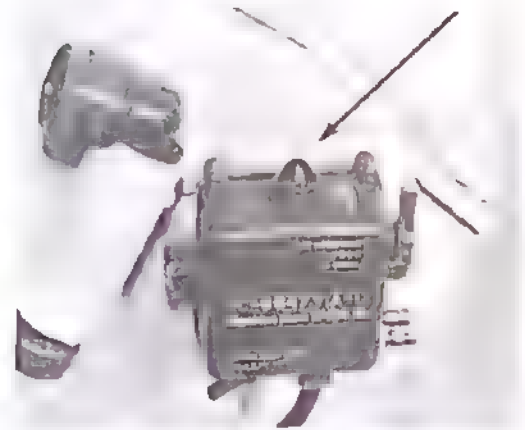
. . . and ask one of the other crewmen to see if the light on the external interphone box (on the rear of the tank) lights.



(b) Ask the other crewman to press the push-to-talk-and-listen switch on the hand set in the external interphone box . . .



. . . and see if the light on top of the turret box lights.



**4** (If neither light lights, go on to Step 5.) If only one light lights, unscrew the jewel (red glass button), and put in a new bulb (Nr 1252). (Note: If the jewel on the turret box is frozen, use pliers, being careful not to damage it.)

**5** (CAUTION: Before changing the fuse, turn the switch on the driver's external interphone control box to OFF.)

If neither light lights, take the fuse out of the fuse holder in the driver's external interphone control box, and put in a new 3-amp fuse. If the lights still do not light, tell the tank commander.

(Note: The SIGNAL LAMP TEST switch on the turret interphone signal box is used by the radio mechanic to check the external interphone light system.)

## Checking talking over the external interphone.

**1** Turn on the interphone amplifier.

**3** Ask one of the other crewmen to press the push-to-talk-and-listen switch on the hand set in the external interphone box and to speak into the hand set. (As the crewman speaks, turn the VOL knob on the side of the control box where the chest or hand set is plugged in until his voice is heard clearly.)

**5** If the hand set or other parts of the external interphone are damaged, or if talking over the external interphone is not satisfactory, tell the tank commander. The press-to-talk-and-listen switch in the hand set must be pressed to either receive or transmit.

**2** Plug a head and chest set (or a hand set) into one of the plug-ins on the side of the interphone control box on the turret wall.

**4** While the other crewman presses the push-to-talk-and-listen switch on the hand set in the external interphone box, press the INTERPHONE button on the chest set and speak into the microphone. (The other crewman should turn the VOLUME knob on the external interphone until he can hear clearly.)



# USING THE TANK RADIOS

## Preparing to use the radios.

**1** Find out from the tank commander whether radio silence is being kept. If the tank radios are supposed to keep radio silence, do not turn on any of the sets except the interphone amplifier.

**3** If radio silence is not being kept,

(a) Maintain the head and chest sets, and put them on.

(b) Plug the chest set into the control box (on the turret wall).

(c) Turn the selector switch of the control box to the center position.

**2** Find out from the tank commander whether listening silence is being kept. If the tank radios are supposed to keep listening silence, any of the sets may be turned on, but the crewmen must not talk over the radios and must not press the RADIO buttons on the chest sets.

(d) Find out from the tank commander what channel frequencies to use on Set 1, Set 2, and the auxiliary receiver.

(e) Put Set 1, Set 2, and the auxiliary receiver into operation. Turn the OPERATE switch on the Set 1 power supply to RECEIVE.

## Entering the net.

(Note: The tank radios may be in as many as three different nets. That is, there may be one net for Set 1, another for Set 2, and still another for the auxiliary receiver.)

**1** If neither radio silence nor listening silence are being kept,

(a) Find out from the tank commander when the tank radios are supposed to enter each net, and what call sign (for example, ALFA BRAVO THUH-REE) to use for each net.

(b) At the exact time that a net is to be opened, listen for the net call (for example, the net control station may say, "ALFA BRAVO—THIS IS ALFA BRAVO SIX—OVER.")

(c) If the auxiliary receiver net is being opened, tune Set 1 to the frequency of the auxiliary receiver.

(d) Turn the selector switch of the control box to the proper position. If the net is being opened on Set 1 or the auxiliary receiver, turn the switch to the counter-clockwise position; if the net is being opened on Set 2, turn the switch to point to the clockwise position.

(e) After hearing the net call,

(1) Hold or lock the switch on top of the control box in the RADIO TRANS position.

(2) Report into the net in the correct order. For example, within five seconds after ALFA BRAVO TWO has reported into the net, press the RADIO button on the chest set and say, "ALFA BRAVO SIX—THIS IS ALFA BRAVO THUH-REE—OVER."

(Note: If Set 1 fails to transmit or to receive, unscrew—one at a time—the four fuse holders on the power supply and replace those fuses that may be burned out. Make sure that the number on the metal end of each fuse corresponds with the number stenciled above the fuse holder on the power supply panel.)

**2** If the net has been opened earlier, or if the tank is late in entering the net, say, for example, "ALFA BRAVO SIX—THIS IS ALFA BRAVO THUH-REE REPORTING INTO NET—OVER."

## Talking over the radios.

**1** Before talking, the crewman must,

(a) Write or plan the message, so that it will be as short and clear as possible.

(b) Listen, to make sure that other stations are not talking.

**2** While talking, the crewman must,

(a) Speak clearly and slowly.

(b) Not carry on unofficial conversations.

(c) Not say his own name nor the name, location, nor identity of any other station.

(d) Not swear nor use plain talk.

(e) Use radio words wherever possible.

## Using radio words.

**1** To begin talking with another station (for example, with another tank), use the call sign of the other station.

Example:

CD7 says, "CHARLIE DELTA NINER—THIS IS CHARLIE DELTA SEVEN—OVER."



- 2** After the other station answers, and until the conversation is ended, the crewman must always give his own call sign, but he does not need to give the call sign of the other station.

Example:

EF2 says, "ECHO FOXTROT SIX—THIS IS ECHO FOXTROT TWO—OVER."

EF6 answers, "THIS IS ECHO FOXTROT SIX—OVER."

EF2 says, "THIS IS ECHO FOXTROT TWO—DO YOU HAVE EXTRA RATIONS—OVER "

- 3** OVER. Until the conversation is ended, end each message with the word, OVER.

Example:

GH1 says, "GOLF HOTEL EIGHT  
—THIS IS GOLF HOTEL ONE  
—OVER."

- 4** OUT. To end the conversation use the word, OUT.

Example:

IJ7 says, "THIS IS INDIA JULI-  
ETT SEVEN—I WILL TELL  
YOU WHEN THE CONVOY  
COMES—OUT."

- 5** ROGER. To tell another crewman that his message has been heard and understood, use the word, ROGER.

Example:

KL6 says, "KEELO LEEMA TWO—THIS IS KEELO LEEMA SIX—OVER."

KL2 answers, "THIS IS KEELO LEEMA TWO—OVER."

KL6: "THIS IS KEELO LEEMA SIX—THE CONVOY HAS ARRIVED—OVER."

KL2: "THIS IS KEELO LEEMA TWO—ROGER—OUT."

(Note: The word, ROGER, may not be used to mean affirmative or yes. Thus, if MN4 says, "THIS IS MIKE NOVEMBER FO-WER—DO YOU NEED OIL—OVER," in order to tell MN4 that he needs oil, MN7 must say, "THIS IS MIKE NOVEMBER SEVEN—AFFIRMATIVE—OVER.")

(Note: The crewman may hear the word, WILCO, used over the radio. WILCO is used by those who are in command. Thus, the crewman should not usually use the word, WILCO.)

- 6** AFFIRMATIVE and NEGATIVE. Use the word AFFIRMATIVE to mean yes; use the word NEGATIVE to mean no.

(Note: The words, yes and no, are so short that they cannot be heard as clearly as the words, AFFIRMATIVE and NEGATIVE.)

Example:

OP6 says, "OSCAR PAPA FI-YIV—THIS IS OSCAR PAPA SIX—OVER."

OP5 answers, "THIS IS OSCAR PAPA FI-YIV—OVER."

OP6: "THIS IS OSCAR PAPA SIX—DO YOU SEE BUNKER ON YOUR LEFT FRONT—OVER."

OP5: "THIS IS OSCAR PAPA FI-YIV—NEGATIVE—OVER."

OP6: "THIS IS OSCAR PAPA SIX—ROGER—OUT."

**7 I SPELL.** When the crewman needs to transmit a word which is hard to say, words which the other party may not easily understand, or words which name geographical locations (towns, rivers, lakes, etc.), the crewman says, I SPELL, and spells the word, using the proper radio spelling words. The radio spelling words are:

A ALFA	J JULIETT	S SIERRA
B BRAVO	K KEELO	T TANGO
C CHARLIE	L LEEMA	U UNIFORM
D DELTA	M MIKE	V VICTOR
E ECHO	N NOVEMBER	W WHISKEY
F FOXTROT	O OSCAR	X X-RAY
G GOLF	P PAPA	Y YANKEE
H HOTEL	Q KAY-BECK	Z ZULU
I INDIA	R ROMEO	

If the radioman can say the word, he says it before and after he spells it.

Example:

QR3 says, "KAY-BECK ROMEO SIX—THIS IS KAY-BECK ROMEO THUH-REE—OVER."

QR6 answers, "THIS IS KAY-BECK ROMEO SIX—OVER."

QR3: "THIS IS KAY-BECK ROMEO THUH-REE—THE NAME OF THE RIVER ON OUR LEFT FRONT IS DNEIPER I SPELL DELTA NOVEMBER ECHO INDIA PAPA ECHO ROMEO DNEIPER—OVER."

QR6: "THIS IS KAY-BECK ROMEO SIX—ROGER—OUT."

**8** When the crewman says numbers, he says them as follows:

Ø ZERO	2 TWO	4 FO-WER	6 SIX	8 EIGHT
1 ONE	3 THUH-REE	5 FI-YIV	7 SEVEN	9 NINER

The crewman says numbers one by one, except for even hundreds or thousands. Time is always given in numbers, one by one.

Examples:

26 TWO SIX

41 FO-WER ONE

5Ø FI-YIV ZERO

136 ONE THUH-REE SIX

9ØØ NINER HUNDRED

15ØØ ONE FI-YIV HUNDRED

(time)Ø9ØØ ZERO NINER ZERO ZERO

**9** (a) When a crewman has missed an entire message he will transmit a SAY AGAIN request.

Example:

ST9 says, "SIERRA TANGO FO-WER—THIS IS SERRIA TANGO NINER—SAY AGAIN—OVER."

ST4 answers, "THIS IS SIERRA TANGO FO-WER—I SAY AGAIN SIERRA TANGO NINER—THIS IS SIERRA TANGO FO-WER—ENEMY TANK PLATOON ON YOUR LEFT FLANK—OVER."

ST9 says, "THIS IS SIERRA TANGO NINER—ROGER—OUT."

(b) When a crewman has missed the text of a message he will transmit a SAY AGAIN TEXT request.

Example:

WE3 says, "WHISKEY ECHO FI-YIV—THIS IS WHISKEY ECHO THUH-REE—SAY AGAIN TEXT—OVER."

WE5 answers, "THIS IS WHISKEY ECHO FI-YIV—I SAY AGAIN TEXT—ASSEMBLE AT AREA RED—OVER."

WE3 says, "THIS IS WHISKEY ECHO THUH-REE—ROGER—OUT."

(c) When a crewman misses a word in the text of a message, he will transmit a SAY AGAIN WORD BEFORE or SAY AGAIN WORD AFTER request.

Example 1:

AM9 says, "ALFA MIKE SIX—THIS IS ALFA MIKE NINER—SAY AGAIN WORD BEFORE GALLONS—OVER."

AM6 answers, "THIS IS ALFA MIKE SIX—I SAY AGAIN WORD BEFORE GALLONS—THOUSAND—OVER."

AM9 says, "THIS IS ALFA MIKE NINER—ROGER—OUT."

Example 2:

AM9 says, "ALFA MIKE SIX—THIS IS ALFA MIKE NINER—SAY AGAIN WORD AFTER THREE—OVER."

AM6 answers, "THIS IS ALFA MIKE SIX—I SAY AGAIN WORD AFTER THREE—THOUSAND—OVER."

AM9 says, "THIS IS ALFA MIKE NINER—ROGER—OUT."

(d) When a crewman has missed part of a message, he will transmit a SAY AGAIN ALL AFTER or SAY AGAIN ALL BEFORE request.

Example 1:

ZY3 says, "ZULU YANKEE ONE—THIS IS ZULU YANKEE THUH-REE—SAY AGAIN ALL AFTER ACCOMPLISHED—OVER."

ZY1 answers, "THIS IS ZULU YANKEE ONE—I SAY AGAIN ALL AFTER ACCOMPLISHED—REQUEST FURTHER ORDERS—OVER."

ZY3 says, "THIS IS ZULU YANKEE THUH-REE—ROGER—OUT."

Example 2:

ZY3 says, "ZULU YANKEE ONE—THIS IS ZULU YANKEE THUH-REE—SAY AGAIN ALL BEFORE ACCOMPLISHED—OVER."

ZY1 answers, "THIS IS ZULU YANKEE ONE—I SAY AGAIN ALL BEFORE ACCOMPLISHED—ZULU YANKEE THUH-REE—THIS IS ZULU YANKEE ONE—PLAN RED AND BLUE—OVER."

ZY3 says, "THIS IS ZULU YANKEE THUH-REE—ROGER—OUT."

(e) When a crewman misses a portion of the text of a message, he will transmit a SAY AGAIN \_\_\_\_\_ TO \_\_\_\_\_ request.

Example:

DG5 says, "DELTA GOLF FO-WER—THIS IS DELTA GOLF FI-YIV—SAY AGAIN MINEFIELD TO ASSIGNED—OVER."

DG4 answers, "THIS IS DELTA GOLF FO-WER—I SAY AGAIN MINEFIELD TO ASSIGNED—MINEFIELD CLEARED PROCEED ON ASSIGNED—OVER."

DG5 says, "THIS IS DELTA GOLF FI-YIV—ROGER—OUT."



## **10** SPELL. Ask the other party to SPELL. The crewman may ask the other party to SPELL WORD BEFORE (a word in the message) or to SPELL WORD AFTER (a word in the message).

Example:

WX6 says, "WHISKEY X-RAY TWO—THIS IS WHISKEY X-RAY SIX—OVER."

WX2 answers, "THIS IS WHISKEY X-RAY TWO—OVER."

WX6: "THIS IS WHISKEY X-RAY SIX—TELL ME WHEN YOU ARE AT PYONGYANG—OVER."

WX2: "THIS IS WHISKEY X-RAY TWO—SPELL WORD AFTER AT—OVER."

WX6: "THIS IS WHISKEY X-RAY SIX—WORD AFTER AT PYONGYANG—I SPELL—PAPA YANKEE OSCAR NOVEMBER GOLF YANKEE ALFA NOVEMBER GOLF PYONGYANG—OVER."

WX2: "THIS IS WHISKEY X-RAY TWO—ROGER—OUT."

## **11** WAIT. If the crewman in the middle of sending a message needs to pause for a few seconds, he must say WAIT. If it is necessary for him to pause over 5 seconds, he must say WAIT OUT, and call back later.

Example:

YZ6 says, "YANKEE ZULU ONE—THIS IS YANKEE ZULU SIX—REPORT YOUR POSITION AT WAIT (pause) 1600 HOURS—OVER."

YZ1 answers, "THIS IS YANKEE ZULU ONE—ROGER—OUT."

## **12** Correcting transmitted errors.

(a) If the crewman makes a mistake while sending a message, he may use the word CORRECTION.

Example:

AC4 says, "ALFA CHARLIE FI-YIV—THIS IS ALFA CHARLIE FO-WER—OVER."

AC5 answers, "THIS IS ALFA CHARLIE FI-YIV—OVER."

AC4: "THIS IS ALFA CHARLIE FO-WER—WE NEED THUH-REE CORRECTION NEED FO-WER BOXES OF CALIBER THUH-REE ZERO AMMO—OVER."

AC5: "THIS IS ALFA CHARLIE FI-YIV—ROGER—OUT."

(b) When a crewman has transmitted most of a message, and finds it incorrect before completing the transmission, he can cancel the message by use of the phrase: DISREGARD THIS TRANSMISSION—OUT.

Example:

BD3 says, "BRAVO DELTA SEVEN—THIS IS BRAVO DELTA THUH-REE—OVER."

BD7 answers, "THIS IS BRAVO DELTA SEVEN—OVER."

BD3 says, "THIS IS BRAVO DELTA THUH-REE—WE ARE SENDING YOU FI-YIV—DISREGARD THIS TRANSMISSION—OUT."

(Note: A message which has been completely transmitted may only be cancelled by another message.)

## **13** UNKNOWN STATION. If the radioman is unable to hear the call sign of the other party, he may use the words UNKNOWN STATION.

Example:

EG9 says, "ECHO GOLF FI-YIV—THIS IS (EG5 fails to hear the call sign)—OVER."

EG5 answers, "UNKNOWN STATION—THIS IS ECHO GOLF FI-YIV—OVER."

# INSTALLING AND REMOVING THE RETRANSMISSION UNIT (CONTROL C-435/GRC)

## Installing the retransmission unit.

**1** Take off the recoil guard (in front of the radios).

**2** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

**3** Unscrew the cover of the 26-pin connector on the back of the unit.

**4** Screw the cover into place on the cover holder next to the connector.



**5** Make sure that the locking lever next to the POWER lamp on the mount is lifted up.

**6** Slide the unit into place in the mount as far as it will go.





- 7** Lock the unit in the mount by pushing down the locking lever.



- 8** Replace the recoil guard.

### **Removing the retransmission unit.**

- 1** Take the recoil guard from in front of the radios.

- 2** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

- 3** Lift up the locking lever next to the POWER lamp on the mount.

- 4** Slide the unit out of the mount.

- 5** Unscrew the cover from the cover holder on the back of the unit.

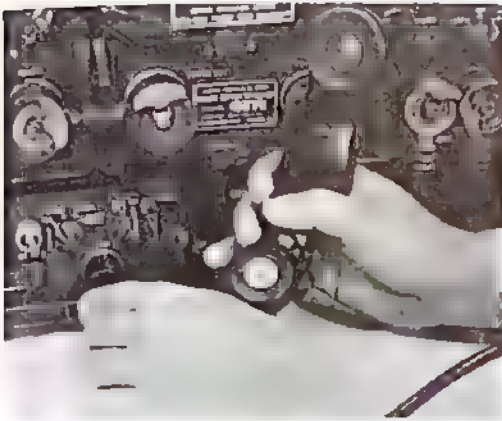
- 6** Screw the cover over the 26-pin connector next to the cover holder.

- 7** Replace the recoil guard.

# Manual operation of the retransmission unit.

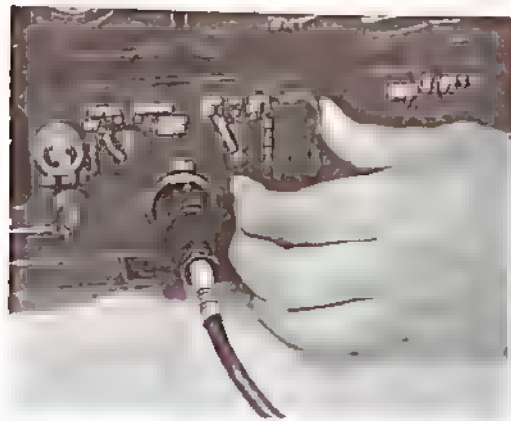
**1** Install the retransmission unit in the radio mount.

**3** Plug a hand set (or a head and chest set) into the AUDIO plug-in on the face of the retransmission unit.



**2** Put Set 1 and Set 2 into operation. (Note: The auxiliary receiver may also be used, if needed.)

**4** To talk over Set 1, hold the MANUAL switch in the SEND SET 1 position, and press the push-to-talk switch on the hand set or the RADIO button on the chest set.

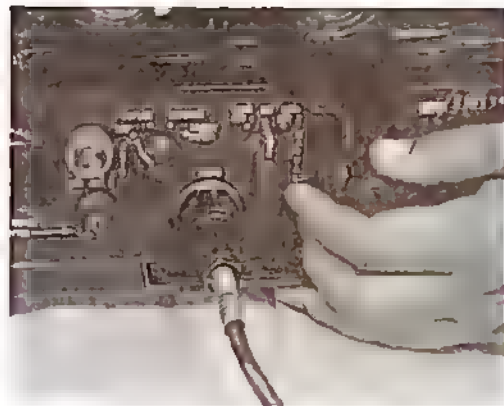


**5** To talk over Set 2, hold the MANUAL switch in the SEND SET 2 position and press the push-to-talk switch on the hand set or the RADIO button on the chest set.



**6** To listen on either set or the auxiliary receiver, release the MANUAL switch and let it rest in the INT position.

(Note: With the manual switch in the INT position, press the RADIO button on the chest set to talk over the tank's interphone system.)



**Putting the retransmission unit into operation for communication between two radios that will not "net" with each other (and for communication between two radios which are too far apart for direct communication). (Automatic retransmission.)**

**1** Put the tank radios into operation (except for the auxiliary receiver).

(CAUTION: Adjust the SQUELCH control on Set 1 and Set 2 until there is no rushing sound.)

**3** Plug a head and chest set into the AUDIO plug-in of the face of the retransmission unit.

**5** Ask for a test signal from the requesting station. (Note: The test signal should be a steady tone such as saying "BAA" into the transmitter.)

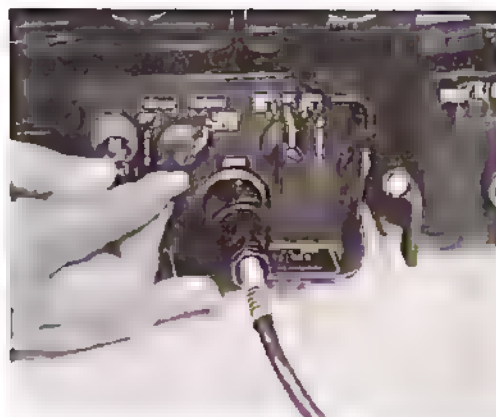
(Note: A transmission is received on Set 1 requesting automatic retransmission to another station through your Set 2.)

**2** Install the retransmission unit in the radio mount.

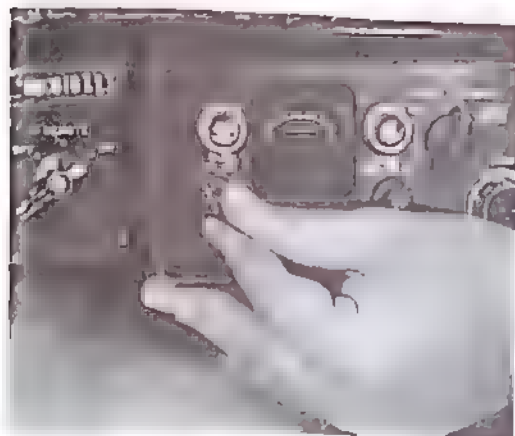
**4** Hold the MANUAL switch in the SEND SET 1 position, and press the RADIO button on the chest set.

**6** Release the MANUAL switch.

**7** Hold the AUTO switch in the ADJUST METER position.



**8** When the SIGNAL REC SET 1 light glows, turn the knob under the light until the meter needle is in the middle of the dial, or as close to it as possible and while holding the AUTO switch in the ADJUST METER position. If the light does not glow, tell the tank commander.



**9** Release the AUTO switch and let it rest in the RETRANS position.

**10** Hold the MANUAL switch in the SEND SET 1 position and tell the sender on Set 1 to stand by.

**11** Hold the MANUAL switch in the SEND SET 2 position.

**12** Contact the radio station that will receive the retransmitted message through your Set 2, and request a test signal. (Note: The test signal should be a steady tone such as saying "BAA" into the transmitter.)

**13** Release the MANUAL switch.

**14** Hold the AUTO switch in the ADJUST METER position.

**15** When the SIGNAL REC SET 2 light glows, and while holding the AUTO switch in the ADJUST METER POSITION, turn the knob under the light until the meter needle is in the middle of the dial, or as near to it as possible. If the light does not glow, tell the tank commander.



**16** Release the AUTO switch and let it rest in the RE-TRANS position.

**18** Holding the MANUAL switch in the SEND SET 1 position, tell the station that requested retransmission to send his message.

**17** Holding the MANUAL switch in the SEND SET 2 position, tell the sender on Set 2 to stand by.

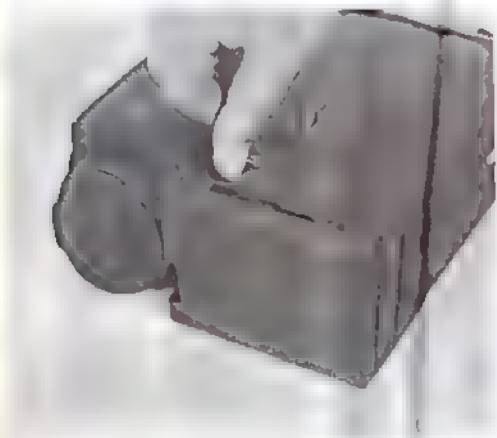
(CAUTION: The AUTO switch is never placed in the DUPLEX position without instructions from the tank commander.)



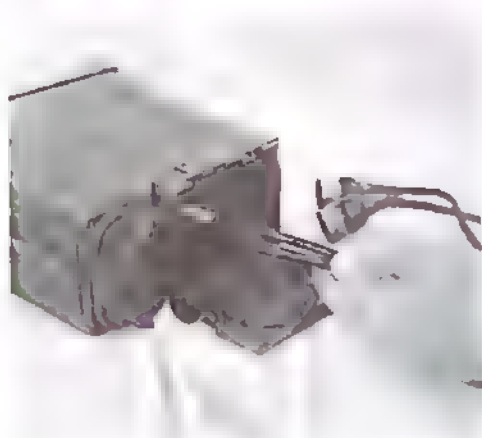
# INSTALLING AND REMOVING THE LOCAL CONTROL AND THE REMOTE CONTROL UNITS

## Preparing the LOCAL CONTROL unit for use.

**1** Push the OPEN catch in the direction of the arrow, to open the door of the cord compartment at the back of the unit.



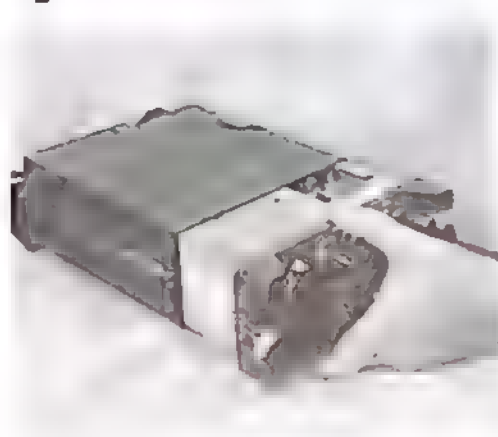
**2** Straighten out the cords.



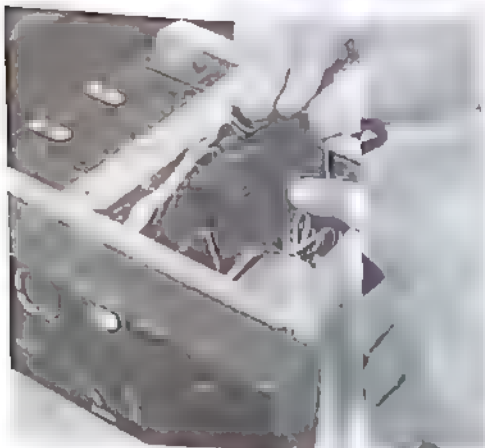
**3** Loosen the wing nuts on the face of the unit.



**4** Slide the unit out of its case.

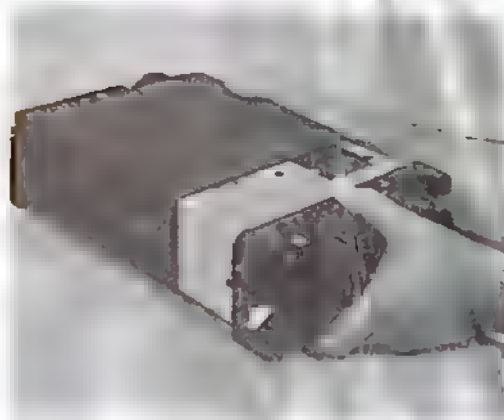


- 5** Push the clip and make the cover off the battery box labeled BATTERIES -30.



- 7** Replace the cover of the battery box.

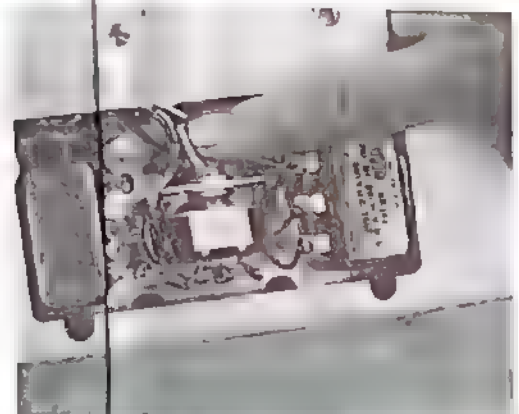
- 9** Slide the unit back into its case.



- 6** Put in two flashlight batteries so that the flat end of each one rests on its spring (that is, so that the front battery is flat end up and the back battery is flat end down).



- 8** Set the SIGNAL SELECTOR switch on BELL or on LAMP as desired.



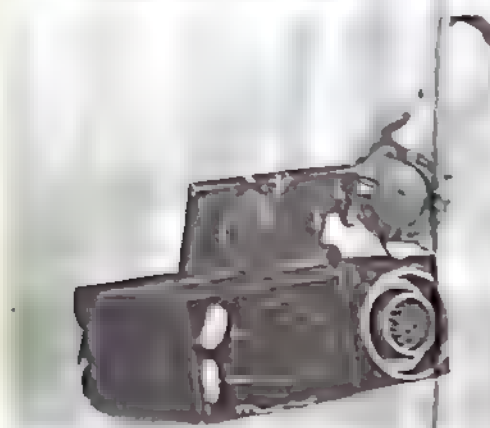
**10** Tighten the wing nuts.



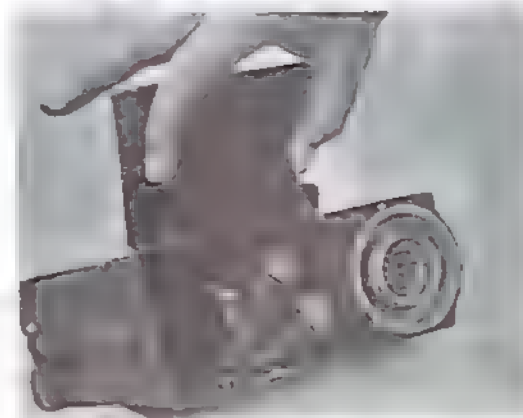
**11** Fold the cords into the cord compartment.



**12** Unscrew the cover of the 26-pin connector on the back of the unit.



**13** Screw the cover into place on the inside of the door of the cord compartment.



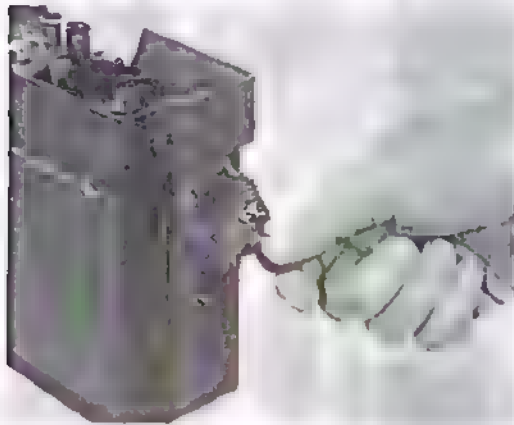
**14** Close the door of the cord compartment.

## Installing the LOCAL CONTROL unit in the radio mount.

**1** Take the recoil guard from in front of the radios.

## Preparing the REMOTE CONTROL unit for use.

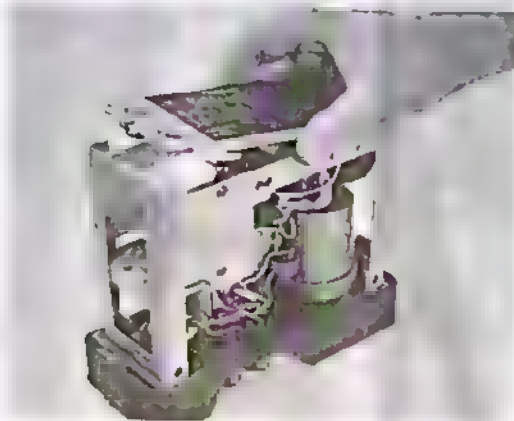
- 1** Unsnap the catches on each side of the unit.



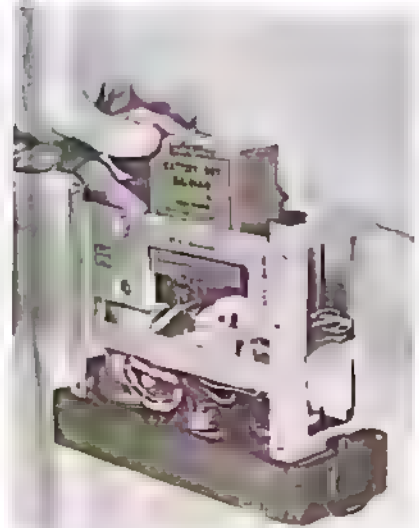
- 2** Pull the unit out of its case.



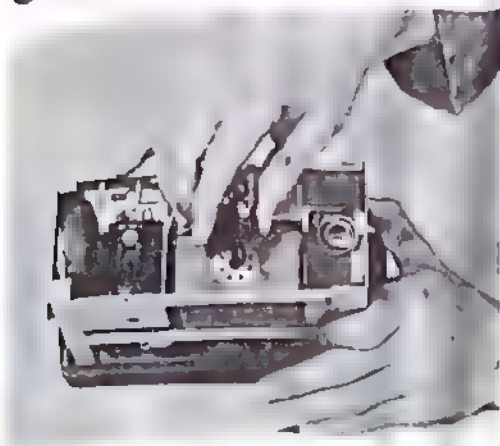
- 3** Slide the cover on the back of the unit to one side and take it off.



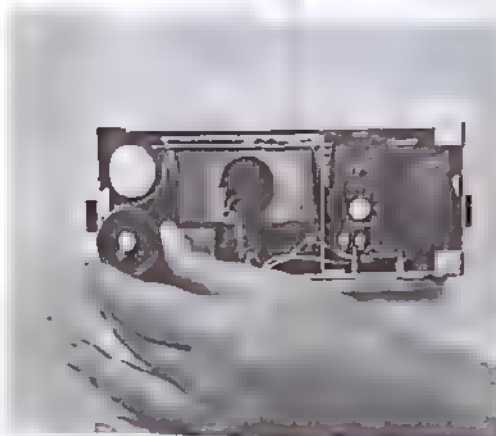
- 4** Put a BA-414 battery into its place in the unit.



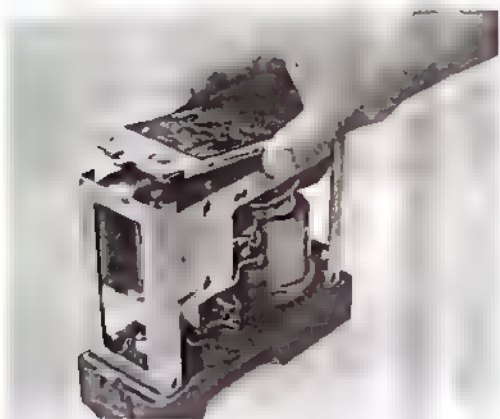
**5** Plug the pronged connector in place in the BA-414 battery.



**6** Put two flashlight batteries so that the flat end of each one rests on its spring (one battery flat end up, the other flat end down).



**7** Slide the cover back on.

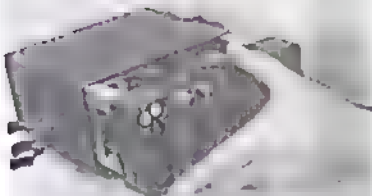


**8** Set the SIGNAL SELECTOR switch on BELL or on LAMP as desired.

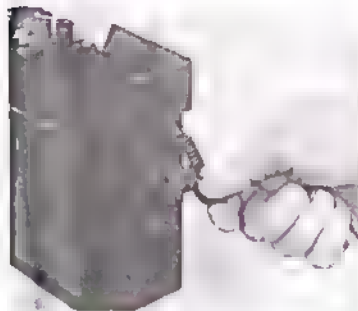




- 9** Slide the unit back into its case.



- 10** Snap the catches.



(Note: The REMOTE CONTROL unit will be installed outside the tank, as ordered.)

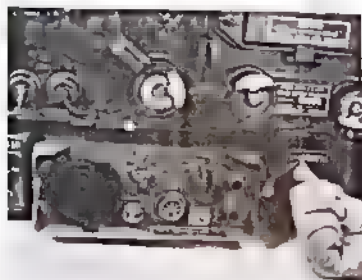
### Removing the LOCAL CONTROL unit.

(Note: If a hand set and field wires have been used, be sure to take them off the unit.)

- 1** If the radios are mounted in the tank, take the recoil guard from in front of the radios.

- 2** Make sure that the OFF-REMOTE-ON switch on the mount is in the OFF position.

- 3** Unlock the unit from the mount by lifting up the locking lever next to the POWER lamp on the mount.



- 4** Slide the unit out of its place in the mount.



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- 5** Open the door of the cord compartment.

- 7** Screw the cover over the 26-pin connector.

- 9** Loosen the wing nuts on the face of the unit.

- 11** Push the clip and open the battery box labeled BATTERIES BA-30.

- 13** Close the box.

- 15** Tighten the wing nuts.

- 17** Close the door of the cord compartment.

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**5** Open the door of the cord compartment.

**7** Screw the cover over the 26-pin connector.

**9** Loosen the wing nuts on the face of the unit.

**11** Push the clip and open the battery box labeled BATTERIES BA-30.

**13** Close the box.

**15** Tighten the wing nuts.

**17** Close the door of the cord compartment.

**6** Unscrew the cover of the 26-pin connector from its place inside the door of the cord compartment.

**8** Straighten out the cords.

**10** Slide the unit out of its case.

**12** Take out the two flashlight batteries.

**14** Slide the unit back into its case.

**16** Fold the cords into the cord compartment.

## Preparing the REMOTE CONTROL unit for stowage.

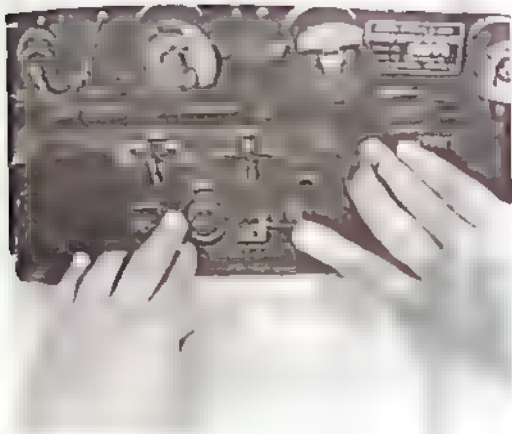
(Note: If a hand set and field wires have been used, be sure to take them off the unit.)

- 1** Unsnap the catches on each side of the unit.
- 2** Pull the unit out of its case.
- 3** Slide the cover on the back of the unit to one side and take it off.
- 4** Take out the two flashlight batteries.
- 5** Unplug the pronged connector from the battery. (BA-414.)
- 6** Take out the BA-414 battery.
- 7** Slide the cover back into place.
- 8** Put the unit back into its case.
- 9** Snap the snap catches.

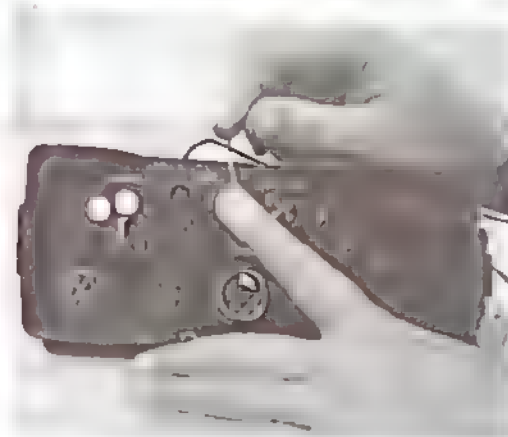
# PUTTING THE LOCAL CONTROL AND REMOTE CONTROL UNITS INTO OPERATION AS A FIELD TELEPHONE

**1** Install the LOCAL CONTROL unit in the radio mount (or on top of the radios).

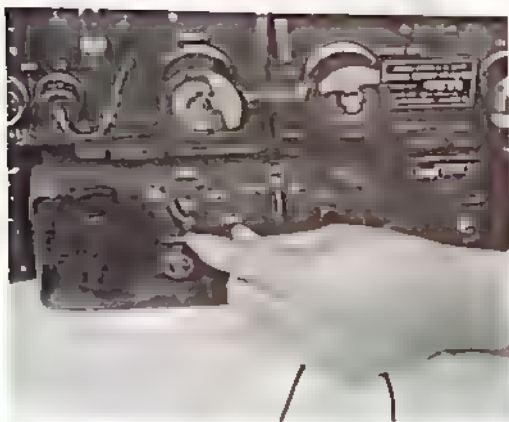
**2** (a) Connect one field wire to the L1 terminal of the LOCAL CONTROL unit and another field wire to the L2 terminal.



(b) Connect one of the field wires from the LOCAL CONTROL unit to the L1 terminal of the REMOTE CONTROL unit and the other field wire to the L2 terminal.



**3** Turn the REMOTE switch on the LOCAL CONTROL unit to the TEL ONLY position.

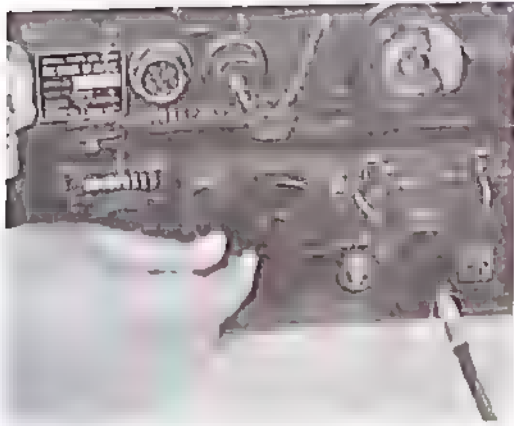


**4** (a) Plug a hand set (or a head and chest set) into the AUDIO plug-in on the face of the LOCAL CONTROL unit.



(b) Plug a hand set (or head and chest set) into the AUDIO plug-in on the face of the REMOTE CONTROL unit.

**5** To signal from one unit to the other, pull out the handle of the crank and turn it.



**6** To talk, press the push-to-talk switch on the hand set.



**7** To listen, release the push-to-talk switch.



## USING THE LOCAL CONTROL UNIT AND THE REMOTE CONTROL UNIT FOR OTHER PURPOSES

Putting the **LOCAL CONTROL** unit into operation to transmit and receive from the tank over Set 1 and Set 2.

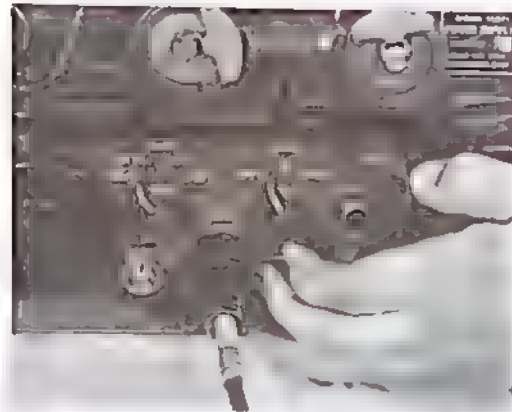
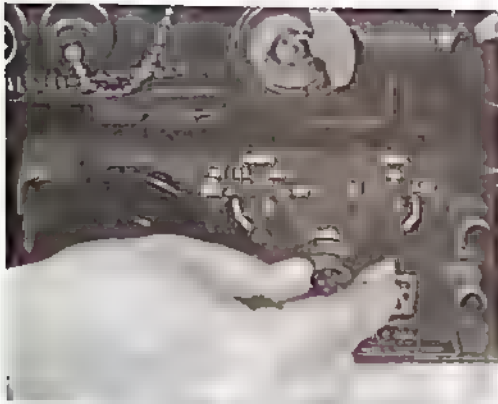
**1** Install the **LOCAL CONTROL** unit in the radio mount (or on top of the radios).

**2** Put the tank radios into operation.

**3** Plug a hand set (or a head and chest set) into the **AUDIO** plug-in on the face of the unit.

**4** To talk over Set 1, push the **LOCAL** switch to the **SET 1** position and press the push-to-talk switch on the hand set.

**5** To talk over Set 2, push the **LOCAL** switch to the **SET 2** position and press the push-to-talk switch on the hand set.



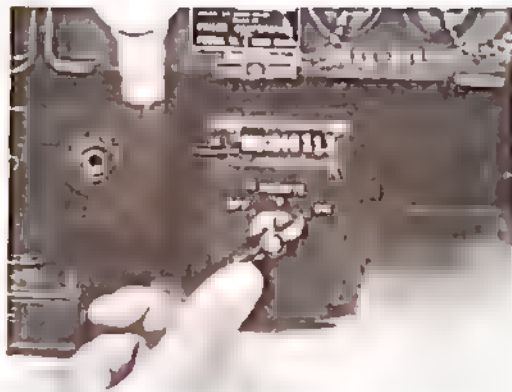
- 6** To listen to incoming messages from Set 1, Set 2, and the auxiliary receiver, leave the LOCAL switch in the TEL position.



## Putting the LOCAL CONTROL unit into operation for transmission from the REMOTE CONTROL unit over both Set 1 and Set 2.

- 1** Install the LOCAL CONTROL unit in the radio mount (or on top of the radios).

- 2** Make sure that the OFF-REMOTE-ON switch on the mount is in the ON position.



- 3** Prepare the REMOTE CONTROL unit for use.

- 4** Put the tank radios into operation.

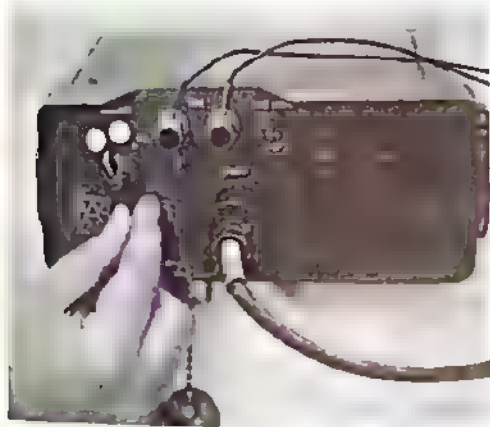
- 5** Connect field wire to the LINE terminals, L1 and L2. (Note: make sure that the other ends of the field wire are connected to the LINE terminals, L1 and L2, of the REMOTE CONTROL unit.)

**6** Plug a hand set (or a head and chest set) into the AUDIO plug-in on the face of the LOCAL CONTROL unit.

**7** Turn the REMOTE switch to the TEL ONLY position.



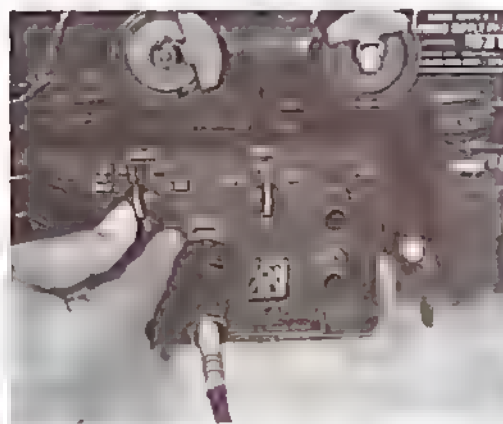
**9** Ask the REMOTE CONTROL operator to set his SELECTOR switch on one of the write-in positions and press the push-to-talk switch on his hand set.



**8** Signal the operator at the REMOTE CONTROL unit by turning the crank. (Note: The REMOTE CONTROL operator should plug in the hand set if he has not already done so.)



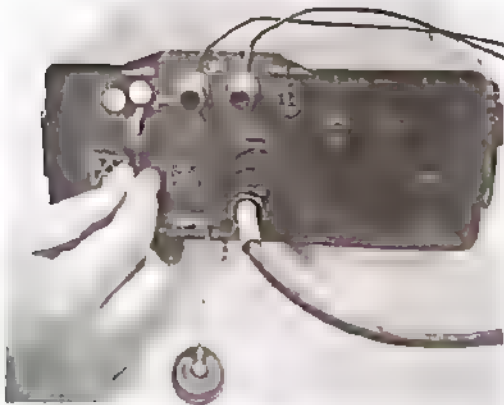
**10** Turn the REMOTE switch to the SET 1 and 2 position.



- 11** Watch the meter needle on Set 1 to see if it "kicks."



- 13** If the needle does not "kick," turn the REMOTE switch to the TEL ONLY position and ask the REMOTE CONTROL operator to set his SELECTOR switch on the other write-in position and press the push-to-talk switch on his hand set.



- 12** If the needle "kicks," turn the REMOTE switch to the TEL ONLY position and telephone the REMOTE CONTROL operator to write the number 1 on the write-in which his SELECTOR switch is set on, and to write the number 2 on the other write-in.



- 14** Turn the REMOTE switch back to the SET 1 and 2 position.

- 15** Watch the meter needle on Set 1 to see if it "kicks."

- 16** If the needle "kicks" this time, turn the REMOTE switch back to the TEL ONLY position and telephone the REMOTE CONTROL operator to write the number 1 on the write in which his SELECTOR switch is now set on, and to write the number 2 on the other write-in.

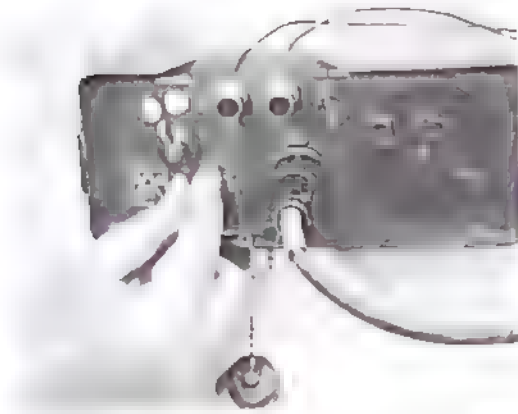
**17** If the needle still does not "kick," tell the tank commander that the LOCAL CONTROL and REMOTE CONTROL system is out of order.

**Putting the LOCAL CONTROL unit into operation to allow power-on-power-off operation and transmission from the REMOTE CONTROL unit over Set 1 and Set 2.**

- 1** Install the LOCAL CONTROL unit in its place in the radio mount. (Note: Power-on—power-off operation, using the LOCAL CONTROL unit, cannot take place unless the LOCAL CONTROL unit is in the radio mount.)
- 2** Put the tank radios into operation.
- 3** Connect field wire to the LINE terminals, L1 and L2. (Note: Make sure that the other ends of the field wire are connected to the LINE terminals, L1 and L2, of the REMOTE CONTROL unit.)
- 4** Prepare the REMOTE CONTROL unit for use.
- 5** Turn the OFF-REMOTE-ON switch on the mount to the REMOTE position.
- 6** Plug a hand set (or a head and chest set) into the AUDIO plug-in on the face of the LOCAL CONTROL unit.
- 7** Turn the REMOTE switch to the TEL ONLY position.
- 8** Signal the operator at the REMOTE CONTROL unit by turning the crank. (Note: The REMOTE CONTROL operator should plug in the hand set if it is not already plugged in.)



- 9** Ask the REMOTE CONTROL operator to set his SELECTOR switch on one of the write-in positions, and press the push-to-talk switch on his hand set.



- 10** Turn the REMOTE switch to the Set 1 position, if transmission over Set 1 is desired. (If transmission over Set 2 is desired, turn the switch to the SET 2 position.)



- 11** Watch the POWER lamp on the mount to see if it lights. (Note: Make sure that the lamp is turned all the way, in the direction of the BRIGHT arrow.)



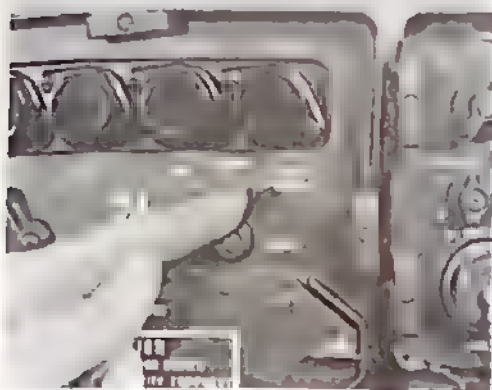
- 12** If the lamp lights, turn the REMOTE switch to the TEL ONLY position and ask the REMOTE CONTROL operator to write ON on the write-in which his SELECTOR switch is set on, and OFF on the other write-in. (Note: The LOCAL CONTROL and REMOTE CONTROL system is now in operation for power-on—power-off use over Set 1.)



(Note: Remind the REMOTE CONTROL operator that he cannot turn off the radio by merely turning his SELECTOR switch to the OFF position. He must also, after turning to the OFF position, press the push-to-talk switch on his hand set.)

## 13 If the lamp does not light, and if transmission over Set 1 is desired,

(a) Make sure that the OPERATE switch on the SET 1 power pack supply is on TRANS and RECEIVE.



(b) Turn the REMOTE switch to the TEL ONLY position, and ask the REMOTE CONTROL operator to change the position of his SELECTOR switch, and to press his push-to-talk switch.

(c) Turn the REMOTE switch to the Set 1 position.

(e) If the needle "kicks," turn the REMOTE switch to the TEL ONLY position, signal the REMOTE CONTROL operator, and tell him to write ON on the write-in which his SELECTOR switch is set on, and OFF on the other write-in. (Note: The LOCAL CONTROL and REMOTE CONTROL system is now in operation for power-on—power-off use over Set 1.)

(d) Watch the needle on the meter on Set 1.



(f) If the needle fails to "kick," tell the tank commander that the LOCAL CONTROL and REMOTE CONTROL system is out of order.

**14** If transmission is desired over Set 2, turn the REMOTE switch to the Set 2 position.

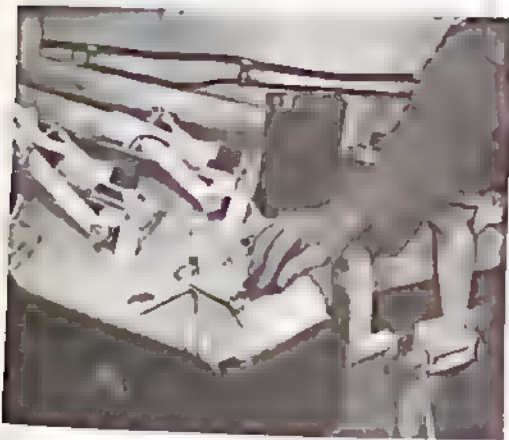
## CLEANING THE TURRET

### Cleaning the inside of the turret.

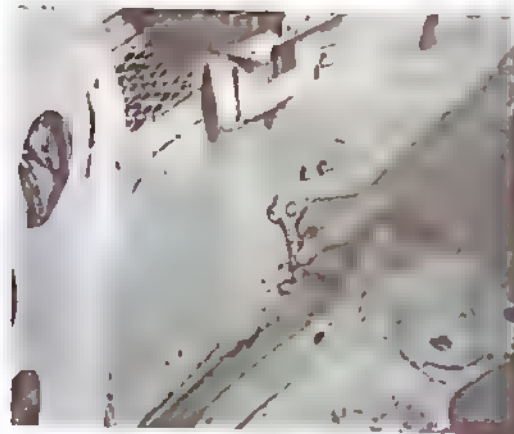
**1** Wash every dirty or oily surface, except the eyepieces of the sights, using rags soaked with cleaning solvent. (Note: Do not use water.)



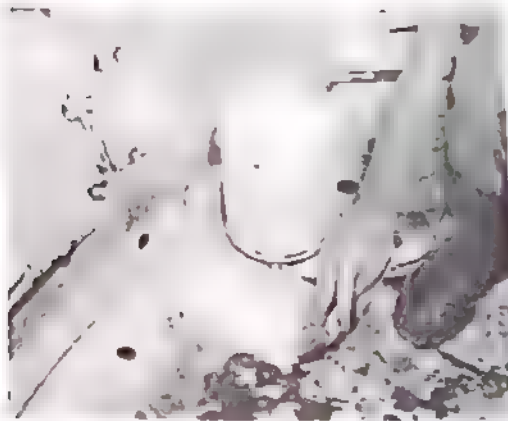
**2** Clean any rusty spots, using rags soaked in bore cleaner, ...



... crocus cloth, or steel wool.



- 3** Under the direction of the tank commander, paint any spots that need repainting with white enamel. (Note: Do not paint where there was no paint before. Do not paint the telescope, periscopes, range finder, azimuth indicator, gunner's quadrant, elevation quadrant, or radios.)



- 4** If necessary, repair the seat covers, using waterproof tape.

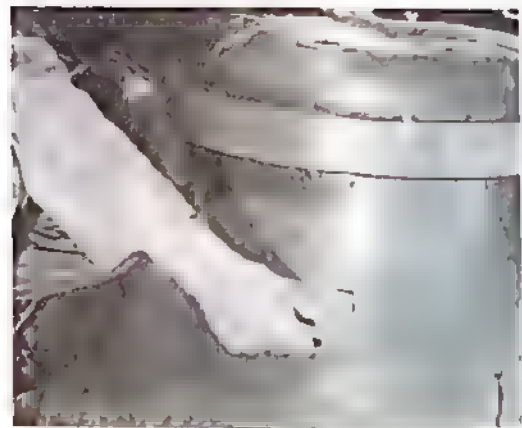


## Cleaning the outside of the turret.

- 1** Wash off any dirt or oil, using cleaning solvent and a scrub brush, or soap and water. (CAUTION: If water is used, make sure that none gets inside the turret.)



- 2** Clean any rusty spots, using emery cloth, steel wool, or rags soaked in bore cleaner.

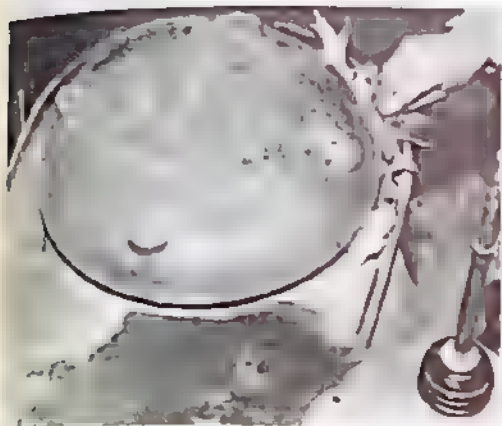


- 3** Paint any spots that need painting, using the type and color of paint specified by the unit commander.



## CHECKING THE TURRET BLOWER

- 1** Clear any trash from around the edge of the blower intake dome (behind the loader's hatch).



- 2** Ask the driver to turn on the MASTER switch.

- 3** Turn the VENTILATOR switch to ON.



- 4** Listen for squeals in the blower. If there are any, tell the tank commander.

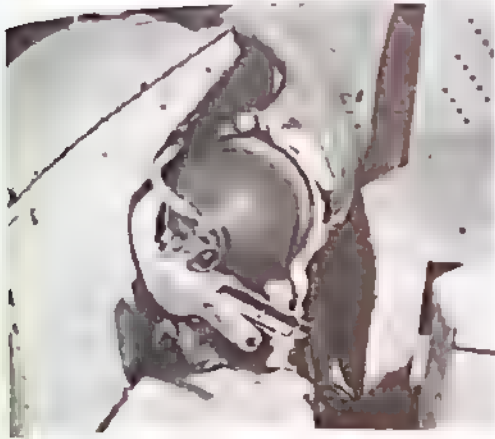
- 5** Turn the VENTILATOR switch to OFF.



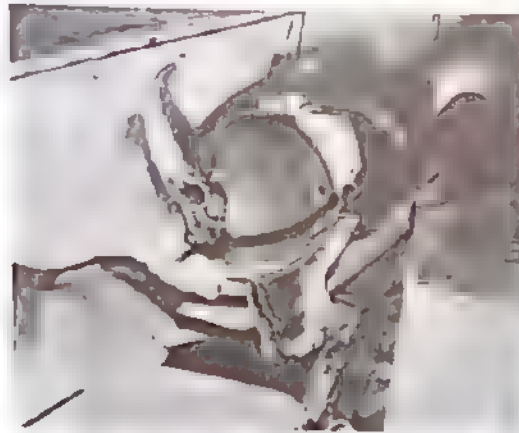
- 6** Ask the driver to turn the MASTER switch to OFF.

# CHECKING THE HAND FIRE EXTINGUISHER

**1** Shake the hand fire extinguisher to make sure it is firmly mounted in the bracket (on the ammunition box under the breech of the gun).



**2** If the extinguisher is loose, tighten the nut on the bottom of the clamp, using an 11/16-inch open-end wrench.



**3** If the mount is loose,

(a) Unsnap the clamp, and take the extinguisher out of the bracket



(b) . . . use a screwdriver to tighten the screw which holds the bracket on the ammunition box . . .



(c) . . . and using a  $\frac{3}{4}$ -inch socket, tighten the nut which holds the bracket on the ammunition box.



**4** Gently pull the seal on the handle at the top of the extinguisher to make sure the seal is not broken. If the seal is broken or missing, tell the tank commander.



**5** Read the date on the ticket tied on the extinguisher. If the date is more than three months old, or if the ticket is missing, tell the tank commander.





# CHECKING THE LOADER'S STOWAGE

## Checking the equipment mounted in the turret.

**1** Make sure that the things listed below are where they should be.

(a) Radios:

- (1) Set 1.
- (2) Set 1 power pack.
- (3) Set 2.
- (4) Interphone amplifier.
- (5) Interphone control box.
- (6) External interphone signal box.
- (7) Antenna lead wire for Set 1.

(8) Antenna lead wire for Set 2.

(9) In some tanks, auxiliary receiver and retransmission CONTROL unit.

(b) Coaxial machinegun:

- (1) Caliber .30 machinegun.
- (2) Link chute.
- (3) Brass bag.

**2** If any of these things are not mounted, tell the tank commander.

## Checking the equipment stowed inside the turret.

**1** Make sure that the things listed below are where they should be.

(a) In the oddment tray:

- (1) Fuze setter.
- (2) Ruptured cartridge extractor.
- (3) Asbestos mittens.
- (4) Caliber .30 repair parts box, containing one bolt (complete).

(b) In brackets:

- (1) 2 submachine guns.
- (2) Flashlight.
- (3) Hand fire extinguisher.

(c) Below the radios:

- (1) Gun tools roll, containing  
4 caliber .30 cleaning brushes  
Caliber .30 chamber brush  
Caliber .30 combination wrench  
Caliber .30 cleaning rod case
- (2) Ramming and extracting tool.

(d) Above the radios:

- (1) Jimmy bar.
- (2) 2 caliber .30 spare barrels.
- (3) 2 caliber .30 spare barrel covers.

(e) In the rack behind the tank commander:

- (1) 2 submachine gun ammo carrying cases.
- (2) 2 dome light spare bulbs.

(f) Inside the turret bustle:

- (1) Canteen with cup and cover.
- (2) Radio spare parts roll, containing 5 antenna sections.  
Head set.  
Chest set.  
Tube kit.  
2 sets of technical manuals .
- (3) In some tanks, LOCAL CONTROL unit and REMOTE CONTROL unit, with bag, hand set, 4 flashlight batteries, and a BA414 battery.

**2** If any of these things are missing, tell the tank commander.

## Checking the equipment stowed outside the turret.

**1** Make sure that the things listed below are where they should be.

(a) On the turret:

(1) Antenna for Set 1.

(2) Antenna for Set 2.

(b) Outside the turret bustle: Field Pack, with suspenders.

(c) On the back of the tank: External interphone.

**2** If any of these things are missing, tell the tank commander.



By Order of *Wilber M. Brucker*, Secretary of the Army:

Official:

**R. V. LEE,**  
*Major General, United States Army,*  
*The Adjutant General.*

**L. L. LEMNITZER,**  
*General, United States Army,*  
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For explanation of abbreviations used, see AR 320-50.		